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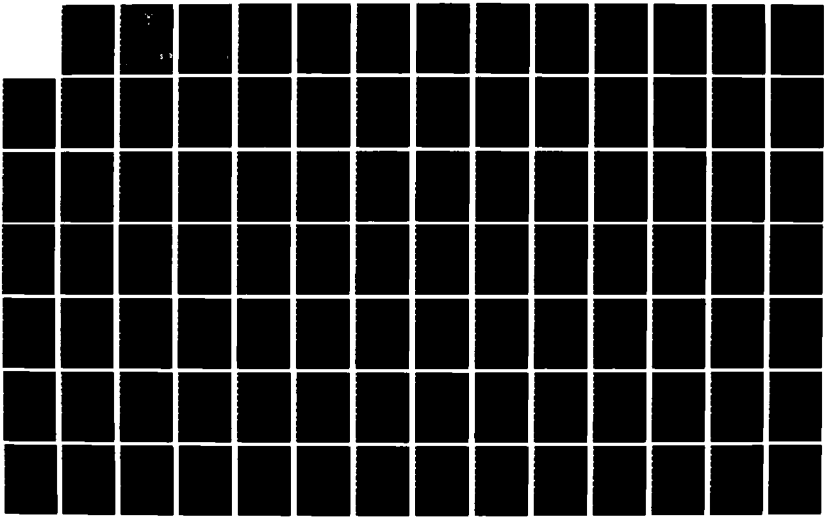

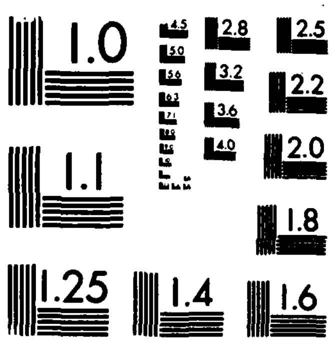
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# ANALYSIS AND MODELING OF THE FACILITY ACQUISITION PROCESS AS IT RELATES TO THE DEVELOPMENT AND DEPLOYMENT OF NEW WEAPON SYSTEMS

THESIS


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AFIT/GEM/LSY/85S-9

# ANALYSIS AND MODELING OF THE FACILITY ACQUISITION PROCESS AS IT RELATES TO THE DEVELOPMENT AND DEPLOYMENT OF NEW WEAPON SYSTEMS

THESIS

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Engineering Management


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September 1985

## Preface

The purpose of this study was to investigate the conflict in timing between the acquisition of new weapon systems and that of support facilities. The idea for the research grew from both a need identified by Air Force Systems Command (AFSC) and the personal and professional interest of the researchers. The principal method of research was through the development and analysis of a computer model of the integrated systems and facilities acquisition process. The model was encoded using the SLAM II simulation language.

Developing an accurate model of the acquisition process would have been impossible without a great deal of help from others. First our advisor, Lt Col William Shaw, provided special help and assistance in understanding the systems acquisition process. Further, Mr. George Taylor gave us almost unlimited access to the ASD/DES program records and provided invaluable insight into the role of the acquisition civil engineer. In addition, Lt Col Paul Baker from AFSC provided some of the key ideas examined in the research. Finally, we wish to thank our wives Debbie and Mindy for their understanding and concern for our research, especially Debbie for her untiring help in typing and formatting.

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## List of Acronyms

| | |
|---|---|
| AE | Architect-Engineer |
| AF | Air Force |
| AFIT | Air Force Institute of Technology |
| AFLC | Air Force Logistics Command |
| AFND | Air Force Need Date |
| AFR | Air Force Regulation |
| AFSC | Air Force Systems Command |
| AFSARC | Air Force Acquisition Review Council |
| AFRCE | Air Force Regional Civil Engineer |
| ASD | Aeronautical Systems Division |
| BCE | Base Civil Engineer |
| BES | Budget Estimation Submission |
| CBD | Commerce Business Daily |
| COE | US Army Corps of Engineers |
| DE | Directorate of Engineering |
| DI | Design Instruction |
| DOD | Department of Defense |
| DODD | Department of Defense Directive |
| DSARC | Defense Systems Acquisition Council |
| FDC | Facilities Design Criteria |
| FIX | Facility Item X-amination |
| F-Panel | Facilities Panel |
| FRP | Facilities Requirements Plan |
| FSD | Full Scale Development |
| FY | Fiscal Year |

| | |
|---|---|
| GPSS | General Purpose Simulation Language |
| ILS | Integrated Logistics Support |
| IOC | Initial Operational Capability |
| JMSNS | Justification of Major Systems New Starts |
| MAJCOM | Major Command |
| MCP | Military Construction Program |
| NAVFAC | Naval Facilities Engineering Command |
| NTP | Notice to Proceed |
| OPR | Office of Primary Responsibility |
| OSD | Office of the Secretary of Defense |
| PCE | Project Cost Estimate |
| PB | Project Booklet |
| PDM | Program Decision Memorandum |
| PM | Project Manager |
| PMD | Project Management Directive |
| PMP | Program Management Plan |
| PO | Program Office |
| POM | Program Objective Memorandum |
| PPBS | Planning, Programming and Budgeting System |
| RDT&E | Research, Development, Test and Evaluation |
| SECDEF | Secretary of Defense |
| SLAM | Simulation Language for Alternative Modeling |
| SON | Statement of Operational Need |
| SOW | Statement of Work |
| USAF | United States Air Force |
| USC | United States Code |

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## Abstract

The purpose of this ~~investigation~~ thesis was to identify potential modifications in the facilities acquisition process to better integrate it into a weapons system acquisition. In order to accomplish this objective, a computer model was developed to simulate the integrated systems and facilities acquisition process and to determine what changes would most favorably impact facility acquisition schedules.

Development and analysis of the model concluded that conflicts in timing came from four sources: 1) development of the list of facilities required to support system bed down; 2) development of the basing and deployment concepts; 3) system and equipment changes during the facility acquisition and; 4) the date and definition of Initial Operational Capability (IOC).

The following additional conclusions were reached regarding the integrated systems and facilities acquisition process. First, only 60% of the bed down facilities would be ready by IOC unless special management attention and handling are provided during processing. Further, an increase of personnel in the various elements of facilities acquisition may have little impact upon project processing time. Finally, the traditional civil engineering management philosophy of waiting for user submittal of requirements before responding may further aggravate an already difficult scheduling problem.

The following recommendations were developed as a result of the research. First, development of facility requirements should begin earlier in the systems acquisition cycle through increased civil engineering part :ipation in the research and development effort. Second, the design of a weapon system's technical facilities should be performed by the systems contractor with contract management and technical support provided by the product division and the US Army Corps of Engineers. Finally, requirements definition and facility design tasking statements with suitable data by-products should be developed by civil engineering organizations for inclusion in weapon system development/production contracts.

# ANALYSIS AND MODELING OF THE FACILITY ACQUISITION PROCESS AS IT RELATES TO THE DEVELOPMENT AND DEPLOYMENT OF NEW WEAPON SYSTEMS

## I. Introduction

The Air Force has often experienced significant difficulty in meeting programmed cost and schedule for the design and construction of facilities associated with the deployment of new weapon systems. As weapon systems become more complex, facility cost growth and schedule slippage problems will certainly intensify (19:103-105).

Unlike normal military construction which is intended to replace obsolete office buildings or dormitories, the facilities programmed to support a new weapon systems deployment are not an end in themselves. The deployment and operation of the system depends largely upon facility availability and adequacy. Thus, schedule slippage which can be tolerated in normal facility delivery can cause serious delays and significant cost growth in new weapon system deployment.

In the early stages of the development of a weapon system, estimates of production schedules and a target date for the delivery of the first operational unit are developed for planning and cost estimating purposes. These schedules often become fixed as Congress accepts the need for the developing system. While usually not considered when the schedule for first unit delivery is developed, the facility acquisition process must respond with completed facilities.

The Air Force plans, programs and purchases facility design and construction through the Military Construction Program (MCP). While not directly tied to the programming for the weapons system acquisition process, MCP heavily depends upon it. Not only does the weapons system acquisition process establish the need date for the needed facilities but it also provides the requirements necessary to initiate the planning and programming for facility acquisition.

## Problem Statement

The cumbersome nature of the Military Construction Program (MCP) is frequently blamed for both the cost and schedule problems of facility acquisition. It is often proposed that streamlining the MCP process would reduce or possibly eliminate the problem. The facility acquisition records and lessons learned reports from various weapon system acquisitions indicate that the real problem is not in the ability to acquire facilities, but in the ability to acquire them in time to support the deployment of a weapon system. Since the facility requirements of a weapons system cannot be fully established until the system is substantially developed, the MCP process must often respond to late and frequently changing requirements.

The President's Private Sector Survey on Cost Control found that the average federal construction project takes seven years from identification of requirements and initial planning to occupancy (19). Planning, programming, and design were found to take sixty months and construction averaged twenty-four months. Projects requiring Congressional approval, as do those under MCP, can take upto fifteen years to complete (19:100). Figure 1 shows the system and facility acquisition processes for a typical weapons system bed down.

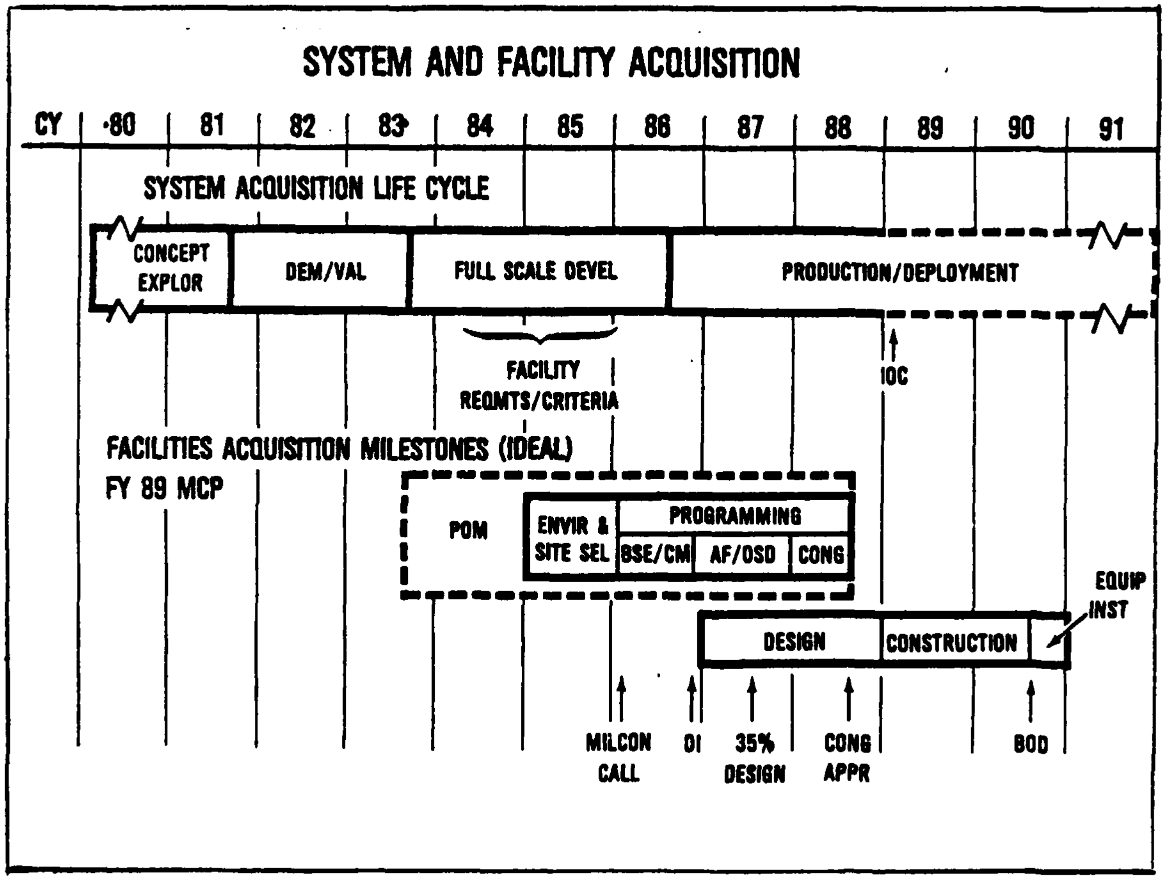



Figure 1. Weapons System and Facility Acquisition Cycles (2)

As indicated on the chart, completion of facilities acquired through even an ideal MCP cycle may lag IOC by several years.

Numerous computer networks have been developed to demonstrate the severity of the problem (24). PERT techniques have been employed in various studies (19) attempting to force the MCP process into an established program schedule. The purpose of this study was to identify potential modifications in the MCP process to better integrate it into the weapon system acquisition process.

## Research Questions

To accomplish the objective of this investigation it was necessary to develop a computer model to simulate the MCP as it is integrated into the systems acquisition process. Then using the model, candidate changes to the MCP (and possibly the weapons system acquisition process) which most favorably compress facility acquisition schedules were identified. The validity of the model depends upon the ability to answer the following research questions:

1. What events or activities in the weapon systems acquisition process trigger events or activities in facility acquisition process?

2. What are the interrelationships and conflicts associated with the two processes?

3. Who are the key players and what are their assigned roles and responsibilities?

4. What activities or events within the two acquisition processes have the most impact on facility completion dates?

## Justification of Methodology

Computer simulation is widely used in studying operational systems. Through its use the researcher can separate large complex processes into smaller more comprehensible activities. He can then study each activity and reconstruct the entire process as a computer model network. It is then possible to alter procedures or to make changes in the organizational structure for study and analysis inexpensively. The computer model permits the researcher to modify system inputs, resources, flow processing or other system variables to predict system behavior (26:1-2).

Representing a system or process with a model has at least five legitimate uses. It aids in the thinking, communicating, training, predicting and experimenting necessary to study an operational system (38:4). This analysis of the MCP process utilizes the predictive and experimental uses of modeling.

Historically, the biggest problems in the simulation of operational systems have been the mathematical complexity of the modeling process and the inability to capture the true nature of the system being modeled. The modeler needs an organized structure for viewing the system to be simulated. Several simulation languages for computers have been developed to provide such a structure. Four of these languages -- GASP, GPSS, SIMSCRIPT and SLAM -- were considered for use in this study.

Each of the languages was designed with a different orientation to the modeled system's operations. The languages can be classified as event-oriented, process-oriented or combined event/process oriented. In the event-oriented languages a change in the state of a system is measured as an instantaneous occurrence or event. SIMSCRIPT is structured as a discrete-event simulation. As a system is modeled over time, changes in state occur at discrete points in time -- those points where an event (such as the arrival of a customer) occurs. SLAM, GPSS and some releases of SIMSCRIPT provide a process-oriented approach to system operation. These languages define a process as a time ordered collection of events, activities, and delays which together form the changes in state of the modeled system (3:53-80).

The SLAM simulation language was found to have the capability to model a system from a process, an event, or from a continuous activity perspective. This, plus a further enhancement which allows "combined network-event-continuous models with interactions between each orientation" (35:74), made it a suitable candidate for modeling the MCP.

## Scope and Limitations

This study investigated the acquisition of new facilities required to support the deployment and operation of a new Air Force weapons system inside the continental United

States. Further, the study was limited to facilities or facility modifications which were included in the Military Construction Program (MCP).

To further define and limit the study the following general assumptions were made:

1. The weapons systems follow the life cycle phases of DODD 5000.1 (Concept Exploration, Demonstration and Validation, Full Scale Development, Production and Deployment).

2. The MAJCOM gaining the weapons system also operates the selected host base.

3. Weapons system deployments requiring construction of an entirely new base complex were excluded.

4. Congressional approval was obtained with minimal delay at the 35% design estimated cost.

5. The U.S. Army Corps of Engineers (COE) served as Design/Construction Agent for the modeled facility projects.

6. An Environmental Assessment was adequate for system deployment.

7. Facility design and construction were accomplished by contract.

8. The Facility construction schedule was based upon providing beneficial occupancy prior to an Air Force Need Date (AFND) established by the deployment schedule of the weapons system.

9. The implementing Product Division provides facility requirements to the responsible MAJCOM for programming.

## II. Literature Review of the Acquisition Processes

The acquisition of new Air Force facilities is always a lengthy and complex process and is normally the responsibility of Civil Engineering (12:1-1). However, during the deployment of a new weapons system the oversight of facilities acquisition becomes an element of Integrated Logistics Support (ILS) in the Weapon System Program Office (PO) (22:24). The program and ILS managers (9) must insure that facility acquisition does not constrain system deployment (24:79).

The Deputy Program Manager for Logistics (DPML), as well as the resident civil engineer, should understand the weapon system acquisition process, the facilities acquisition process, and the interaction between them (24:12-13). This chapter will summarize both acquisition processes and the relevant interfaces and dependencies between them. However, even a full understanding of the process without consideration of the political climate (particularly the budgetary emphasis being placed upon defense), can lead to additional cost and schedule problems.

The process of acquiring supporting facilities must be thoroughly integrated into the overall system acquisition process. To help clarify the underlying framework for this integration, a review of the systems acquisition process and a discussion of the four phases of facility acquisition are provided along with a brief discussion of the ILS function.

## Weapons System Acquisition Process

An acquisition program is "a directed effort funded either through procurement appropriations; through the security assistance program; or through the research, development, test and evaluation (RDT&E) appropriation with the goal of providing a new or improved capability in response to a validated need" (10:Attch.3). The systems acquisition process begins with the identification of a need by an operating command in the Air Force.

The Air Force acquires new systems according to AFR 800-2 (10) which invokes DOD Directive (DODD) 5000.1 (16). This directive breaks the process into four major phases: Concept Exploration, Demonstration and Validation, Full-Scale Development, and Production and Deployment.

Need Identification. Need identification is based upon mission analysis, assessment of available technology, initial life cycle cost analysis, and threat verification and analysis (16:2). A need may be satisfied without acquiring new weapon systems. However, in those cases where new systems or major modifications are necessary, a Statement of Operational Need (SON) is sent to Headquarters Air Force (HQ USAF) (14). If the SON is accepted by HQ USAF, then a Justification of Major Systems New Start (JMSNS) is prepared and approval for Program Initiation is sought by entering the program in the next Program Objective Memorandum (POM). DODD 5000.1 (16) and the accompanying instruction DODI 5000.2 (17) outline the procedures, requirements and approval authority for acquisition programs.

Concept Exploration. If and when the Office of the Secretary of Defense (OSD) issues a favorable Program Decision Memorandum (PDM) in the Planning, Programming and Budgeting System (PPBS) cycle, the program office may initiate the concept exploration phase. A "Program Management Directive (PMD) is issued by HQ USAF naming the implementing, participating and supporting commands" (5:19). "The Air Force seeks alternatives from existing military or commercial sources first, modification of existing equipment next, and finally new systems when adequate solutions are not available" (5:20).

Demonstration and Validation. The results of the concept phase are documented in a System Concept Paper. This paper forms the basis for making decisions to proceed with the second major program phase. This decision, Milestone I, selects those concepts that enter into the Demonstration and Validation phase. The results of Demonstration and Validation are the program plans for system development. These plans address the acquisition strategy schedules, performance, logistics support, and other details (5:20) of the proposed system candidates.

Full Scale Development. After the results of the Demonstration and Evaluation phase are evaluated and the Milestone II, Program Go-Ahead Decision, is passed, the acquisition enters the Full Scale Development phase. During this phase, all required documentation is prepared, the prime mission and support system are designed, and developmental equipment is manufactured. The system and developmental equipment is tested and evaluated to insure it conforms to the performance specifications. Testing includes both the Development Test and Evaluation (DT&E) and the Operational Test and Evaluation (OT&E) programs. The objective of the DT&E program is to demonstrate that the system design is correct and complete per the system specification. The purpose of OT&E is to determine how well the system can be employed and supported in the operational environment.

The facility acquisition process usually begins during the Full Scale Development Phase of the systems acquisition cycle, and depending on the scope of the program, the Air Force Systems Command Product Division (ASD, ESD, or SD) may permanently assign a facility engineer to the PO. This engineer coordinates facilities related activities with the PO and manages early facility acquisition efforts after requirements have been identified. After Full Scale Development is nearly completed, Production and Deployment begins with an Air Force decision at Milestone III (5:21).

<u>Production and Deployment</u>. The Production and Deployment (P&D) phase includes all actions required to produce the system in the necessary quantities and to deploy it for operational use. P&D begins by contracting for production of the prime mission hardware. In addition, all support and

training equipment and initial spares required for system deployment are procured . Also, during P&D the facilities needed for the system must be designed and constructed before deployment.

## The Facilities Acquisition Process

The facility acquisition process necessary to support the bed down of a new weapon system is complex, expensive, and lengthy. Program managers must coordinate all technical, programmatic and ILS decisions which may impact facilities with the civil engineering community.

Facilities are expensive; there was more than $1 billion of construction effort in the bed down of the Ground-Launched Cruise Missile in Europe (1:32). Costs grow with time, and according to Parkinson, cost growth "begins in the program advocacy, the early planning phases, predefinition or in the concept phases" (34:20). Cost growth must be controlled since increases in estimates require additional programming action which increases the risk of project cancellation. Additionally, the cost of correcting mistakes increases in an almost exponential manner from the requirements through the construction phases (4:7).

Hansen determined that "the facility acquisition process is very likely to be a binding constraint" (24:79) on weapon system deployment. He found that the procedures and the time required to get the facilities ready were prohibitive without intensive management and numerous interim positions. Hansen's work and the other references cited in this paper emphasize the need for program and ILS managers to involve the civil engineering community early in the conceptual phase of acquisition to insure that fully functional facilities are constructed in time to support system deployment.

Facility acquisition for the new system bed down is divided into four phases. Each has distinct requirements which input to the next phase. The four phases of the facility acquisition process are: 1) requirements identification, 2) programming, 3) design and 4) construction. While requirements identification is normally a responsibility of the product division, programming, design, and construction fall under MCP.

Requirements Identification. The first phase of facility acquisition is identification of requirements. According to an AFIT thesis by Captain Kevin P. Hansen (24), mission changes are one of the primary reasons new facilities are acquired (24:22). Hansen (24) and the Aeronautical System Division Directorate of Civil Engineering (ASD/DE) "Acquisition Management Orientation" course materials (6) describe how the systems contractor conducts facility studies and as a by-product of the studies develops the Facility Requirements Plan (FRP). The FRP lists the minimum essential facilities required to support the new system (6:3-4). The plan is officially designated under Data Item Description DI-S-6173 in DODL 5000.19L (15) and is to describe the facilities required for testing, training, operational and depot locations. The FRP provides the floor space, mechanical, and electrical characteristics of each facility required and information on the potential reuse of existing facilities as determined by site surveys at the host bases.

Programming. After the determination of the facility requirements the host base begins the programming phase of the MCP Process. Initially the base prepares a DD Form 1391, "Military Construction Project Data", which briefly describes the project, requirement, current situation, impact if not provided, and a cost estimate. For a major system bed down, the MAJCOM or the Air Force Regional Civil Engineer (AFRCE) may assist or actually prepare the DD Form 1391. Once completed the DD Form 1391 is submitted to the MAJCOM for approval (13:3-1).

If the DD Form 1391 is approved by the MAJCOM, the host base prepares a project book for each facility. The project book must be coordinated with the using agency (often the PO), Communications Officer, Fire Chief, Safety Officer, Base Civil Engineer and Base Commander prior to submittal. Upon obtaining the project books, projects are submitted by the MAJCOM to HQ USAF/LEE for review by the Facility Panel (F-Panel) (13:3-3).

If the F-Panel validates the project, a Design Instruction (DI) is issued. The DI informs the MAJCOM, the base, and the responsible AFRCE to proceed with the design of the project. The DI specifies the design agent, the allowable design completion level, project scope, the budget and any changes to the project recommended by HQ USAF (19:2-103).

In September a simplified DD Form 1391 is prepared for incorporation into the Congressional Briefing Booklet. Congressional disposition of the project is based upon this document. Congressional approval of the MCP, unlike the weapons system process, is on a line item basis. If approval is received, the programming phase for the project is complete (11:54).

Design. Although it occurs prior to the completion of the programming phase and does not signify authorization for design completion, the DI issued by HQ USAF to the MAJCOM and the AFRCE marks the beginning of the design phase. After receiving the DI, the AFRCE forwards it and the project book to the design agent (12:4-2). The Army Corps of Engineers (COE), the Naval Facilities Engineering Command (NAVFAC), or occasionally the AFRCE or MAJCOM can serve as the design agent (45:17). The Design Agent then proceeds with in-house design or selects an Architect-Engineer (AE) firm to accomplish the design work. Normally the AE is authorized only to complete design to the 30% level. The design is then submitted for review. Technical review is accomplished by the design agent (COE) while functional review is the responsibility of the AFRCE, MAJCOM, PO, base and the user. Once the review process is complete and comments are incorporated the design is considered 35% complete (12:4-5).

Design to the 35% level is termed Concept Design. The designer may not proceed beyond this point until HQ USAF approves the project. If it receives conditional approval or is not approved, the project must be reprogrammed for the next budget cycle and the design work is terminated. If Congress approves and appropriates construction funds, the designer is instructed to proceed to the 95% level. Projects are not, however, held at 35% design pending budget approval. Assuming the need for a project still exists when it reaches the 35% milestone, HQ USAF authorizes the continuation of design using funds established for procuring AE services. Again the Design Agent and the AF agencies review the drawings and specifications. After incorporation of the review comments the AE submits the final project design. The AE is usually retained on contract to correct design errors, or to incorporate new requirements and user originated changes during construction (19:2-103).

Construction. The AFRCE must now wait for HQ USAF authorization to advertise for bids on the construction of the project. After receipt of authorization, the AFRCE notifies the construction agent who releases a request for bids. Normally, the design agent and the construction agent are the same organization (i.e., COE, NAVFAC, AFRCE or MAJCOM). Within a specified time period, a contract is awarded. During construction, contract changes may be required because of design errors, unforeseen site conditions, changes in requirements, development of new requirements, and problems with material or equipment availability. Since most changes affect construction time and cost, it is important to minimize change This is particularly true when the Air Force need date is tied closely to the initial deployment schedule (IOC) for a new weapons system (19:2-107).

As the project nears completion the Air Force (AF) conducts final acceptance inspections. The contractor corrects any deficiencies and transfers the accepted facility to the using agency. Often in more complex or urgent projects the user accepts the facility in parts (19:2-108). This is known as beneficial occupancy wherein the user occupies part of the facility while the contractor completes work on the remainder.

## Integrated Logistics Support

The Integrated Logistics Support (ILS) Program is governed by AFR 800-8. ILS is the acquisition discipline that insures system requirements and design are supportable and affordable (37:17-12). The Air Force identifies a number of support elements in the ILS program which include reliability, maintainability, supply support, manpower, and facilities.

Early in the Concept Exploration phase the ILS group analyzes the life cycle costs associated with supporting the new system. Also, the various logistics constraints identified in the Systems Concept Paper are expanded and translated into requirements. ILS requirements will continue to evolve throughout the four phases of system acquisition as the logistics elements are blended into the overall acquisition process.

# III. Research Methodology

The methodology describes each of the three distinct parts of the research effort: the literature review, the simulation model, and answering the research questions. The research effort began with a literature review describing the systems and facilities acquisition processes along with a discussion of previous MCP models and thesis work. The literature review was followed by a review of the SLAM simulation language and the development of an MCP simulation model. Finally, the simulation model was analyzed and altered to aid in the formulation of answers to the research questions listed in Chapter I.

## Literature Review

Applicable AF publications and published literature were examined to establish the role and impact of the MCP process on the deployment of a new weapon system. Each phase of the weapon system acquisition process was examined to determine when and how requirements for new or modified facilities were developed.

In order to obtain answers to the first four research questions presented in Chapter I, a review of Army and Air Force publications was conducted to establish the elements which comprise the MCP. These elements were then reduced to a conceptual model (Appendix B) with the agency responsible for each element identified. The inputs associated with facility requirements were then tied to the weapons system acquisition process. This conceptual model later served as the basis for the simulation of the integrated systems and facilities acquisition process.

The publications reviewed established the structure of the process. The next step was to review previous MCP modeling efforts and finally to construct the simulation model and obtain the required supporting data.

### Consideration of Previous MCP Models

The computer simulation model was derived primarily from the Facility Item X-amination (FIX) study (incomplete) accomplished by the engineering staff at Air Force Logistics Command (AFLC) Headquarters in June 1980. The purpose of that study was to develop an exhaustive network analysis of the facility acquisition process. Each of the functional areas within the engineering division of AFLC prepared comprehensive networks of their respective responsibilities in the construction of an MCP facility. Each directorate (Programs, Engineering and Construction) identified all of the activities and events necessary for successful completion of their portion of the process (24:29-30).

These separately identified tasks were then combined to define the complete process. There were a total of 756 separate activities identified which resulted in a very complex network (24:30). The FIX network was never completed and due to its complexity, probably would not have been very useful as a model of the MCP process anyway.

Development of a computer simulation with the detail of activities in the FIX network was not considered feasible nor particularly useful because of the difficulty in obtaining reliable information to quantify the 756 data elements. Thus, it was necessary to combine activities into meaningful groups while attempting to maintain the integrity of the process. Also, since new data could not be generated to satisfy the input needs of the model it was designed around those data elements normally collected.

A study conducted by Capt. Kevin P. Hansen in 1981 (24) used the FIX network to develop a PERT Network diagram of the Facility Acquisition process. This study was performed using considerably less detail than the FIX network and consisted of only seventy-five activity inputs and sixty identified events. However, Capt. Hansen designed the model for a specific weapons system program and therefore it may not fit the more general facility types. It was also based on assumptions which eliminated large blocks of activity.

The model developed in this study is a compromise between the highly detailed FIX study and the generalized approach of the Hansen network. The model was developed using the SLAM programming language (35) and the Cyber computer system at Aeronautical Systems Division, Wright-Patterson AFB, Ohio. The output data collected from the model was analyzed using a traditional statistical approach to model verification and validation. This approach was presented by Pritsker (35), the author of the SLAM programming language, and by Banks and Carson (3), authorities on the analysis of simulation model output.

## The SLAM Model of Integrated Systems and Facilities Process

The SLAM simulation language was chosen due to its relative flexibility. By using SLAM, the system can be approached from a process, event, continuous or single activity perspective. Further, the language allows almost unlimited combinations of these perspectives (35:78-79). Since the facilities acquisition process consists of an intermittent flow of both activities and events through a single network, the adaptive characteristics of the SLAM language were beneficial in generating an accurate model.

Several other simulation languages were considered for use in the model. Facilities acquisition could also have been modeled with the GASP, SIMSCRIPT II.5, or GPSS V languages. These languages, however, offer no distinct advantages over SLAM (3:104). Banks and Carson (3) offer the following reason for choosing a particular language when several are adequate: "If the simulator already knows a language, and that language has the capability to model the given system, familiarity may become the overriding criteria" (3:105). Thus, the SLAM language was selected for its ability to adequately model the acquisition process, and because of the simulators' prior knowledge.

The integrated systems and facilities acquisition model was developed through a five part process. First, a conceptual one-line model was constructed as a basis for the simulation model, followed by application of the SLAM language coding. Next, data were collected to support the various phases of the model. Verification and validation were the two final phases of model development.

## Conceptual Model

Appendix B shows the conceptual model of the integrated systems and facilities acquisition process used to develop the simulation model. This diagram, which details the system, formed the basis of the simulation model and was constructed in three parts. First, a conceptual model of the MCP process was developed from a design and construction management survey performed for HQ USAF (19:102-107). The conceptual model was then augmented with a detailed model of the special requirements phase unique to acquiring the facilities needed to support new weapons systems. Finally, this model which represented only the civil engineering aspects of the facility acquisition process, was overlaid with system and ILS milestones to provide a complete diagram of the integrated systems and facilities acquisition process.

## The SLAM Model

The SLAM model of the integrated systems and facilities acquisition process is presented in Appendix D. The program has been documented with numerous comments to aid the reader in understanding the logic of the code. Before discussing the overall organization and development of the model, however, the following summary is a general description of the various SLAM statements used in the simulation code. The capitalized words in the following three paragraphs refer to specific statements found in the simulation code. For a more complete discussion of the SLAM language see Pritsker (35).

A facility project begins as an "entity" emerging from a CREATE statement and continues in existence until it passes through a TERMINATE statement. Associated characteristics, such as type of project and beginning time, are defined by ASSIGNing various attributes. The project then AWAITs for a person from a RESOURCE group to perform some ACTIVITY. After the ACTIVITY is completed, the person performing the ACTIVITY is FREEed and goes back to the RESOURCE group and the project proceeds to the next step. For example, after a project is identified or CREATEd, it AWAITS for a base level programmer to complete the ACTIVITY of preparing the project booklet. Once the project booklet is complete, the programmer is FREE to begin another task. Since any RESOURCE group may have a number of specific tasks to perform in the MCP process, the order of performance is specified by ASSIGNing a specific PRIORITY to the work.

GATEs represent specific dates or milestones which must occur before a project can move forward. If a project arrives at a GATE which is CLOSEd, it AWAITs until the milestone or date is achieved and the GATE is OPENed. For instance, a project arriving at the GATE labeled NEED must AWAIT for GATE,NEED to OPEN before proceeding. GATE, NEED is OPENed when the Facility Requirements Plan (FRP) is provided by the weapons system contractor.

ACTIVITY nodes can be used to assign probabilities when a project has the possibility of taking more than one path. For instance, ACTIVITY,,.80 and ACTIVITY,,.20 would be used to direct 80% of all projects in one direction and 20% in another. GOON ("go on") statements are used to force the simulation program to continue to the next activity and COLCT statements are used to format and collect data.

The model is organized in four parts; the SLAM control statements, resource and gate identifiers, model segments which control the gates, and the main program. The first block of statements coded in the model are the SLAM control statements. These statements identify the simulators, set limits on the size of the model, initialize the various parameters within the model, and assign the priorities associated with the various events modeled. The resource and gate identifiers follow the control statements. Each resource group is represented by a resource statement which includes data concerning the number of resource elements available and the number of tasks performed by the resource group. Each gate is described by a gate statement which initializes the gate in the open or closed position. The next several groups of statements, listed as model segments, are the controllers for the gates, and in some cases, for the allocation of resources. The final section entitled "Main Program" is the actual coding assigned to the conceptual model. It includes the four basic phases of the facility acquisition process and provides for generation of all data.

## Data Acquisition

Before an accurate model of the integrated systems and facilities acquisition process could be developed, data had to be obtained to verify the accuracy of the conceptual diagram (Appendix B) and support the various SLAM statements used in the computer model (38:19). This data, needed to establish the linkages between the various offices and processes modeled in the MCP process, included personnel strengths and activity processing times. Obtaining the necessary data required contacts with base level, MAJCOM, AFRCE, Air Staff, product division program office, and US Army Corps of Engineers personnel. Only a few bases and MAJCOMS (Myrtle Beach/DE, Andrews/DE, Carswell/DE, MAC/DE, TAC/DE, SAC/DE, and AFSC/DE) were contacted since the facilities acquisition process is virtually the same for each base and MAJCOM. Also, since the process is virtually the same for each AFRCE, only the Eastern Region AFRCE in Atlanta was contacted. AF/LEEPD and AF/LEECD were contacted to represent the HQ USAF. The F-16 tactical fighter and the B-1 bomber program offices were chosen to represent the system program offices and the product divisions. The Baltimore and Louisville Districts were contacted for information regarding the

Army Corps of Engineers' (COE) role in the facility acquisition process.

The needed information was obtained by telephone or personal interviews with the managers closest to the actual process in order to insure the highest degree of accuracy. Questionaires based on the various elements in the conceptual model served as the framework for the interviews to insure the data obtained was complete and the interview was conducted in an orderly manner. The interviews, however, were not tied inflexibly to the questionaires. Because of the wide range of information needed, they tended to be evolutionary as the dialogue progressed.

After analyzing the data from the interviews, the conceptual model was updated where changes were deemed necessary. The SLAM model was then altered to reflect the revisions incorporated into the conceptual model. Finally, the revised model was verified and validated against the process as reflected in the conceptual model.

## Model Verification

The purpose of model verification is to insure that the simulation model actually represents the conceptual model of the integrated systems and facilities acquisition process. In a more general sense, Banks and Carson stipulate that "Verification asks the question: Is the conceptual model with its abstractions and simplifications accurately represented by the computer model" (3:377).

Actual verification of the model followed several suggestions also provided by Banks and Carson (3:379). First, the computer code was double checked for accuracy by several SLAM programmers and debugged of syntax errors. Next, the simulation code was rechecked against the conceptual model for logic error. After determining the logical correctness of the code, the model was run several times and the resulting statistics were checked for reasonableness. These tests, once performed, indicated that the model did, in fact, perform according to the conceptual diagram of the acquisition process. Verification of the model did not, however, indicate to what degree the simulation model or the one-line conceptual model actually replicated the process.

## Model Validation

Verification insures that the simulation model is free of syntax and logic errors and follows the conceptual model. Validation determines how faithfully the verified model represents the real world process being simulated.

The SLAM model of the integrated systems and facilities acquisition process was validated by checking statistical outputs for time and quantities flowing through the model against known values. The statistical times checked included the mean times of projects moving through the four phases of acquisition and the overall mean time for projects in the system. The values obtained from the model were compared with those tabulated in AFR 89-1 (12) and the Engineering

Management Study of the Air Force Design and Construction Management Establishment (19). The input parameters were validated with HQ USAF/LEECD for overall accuracy and with AFSC/DE for accuracy in the requirements phase. The number of projects flowing through the model were validated by comparing the model's output with historical data. Where differences occurred between the model and the real system, the model was calibrated to minimize the deviation.

## Answering the Research Questions

The research questions listed on page three of Chapter I were answered through development, analysis, and manipulation of the simulation model. Development of the model provided direct insight into the events and activities in the weapon systems acquisition process which trigger and moderate the facilities acquisition process. The key players and their roles and responsibilities in the facility acquisition process were also identified during model construction. Analysis of the literature reviewed and the problems associated with projects flowing through the model provided information on the interrelationships and conflicts between systems and facilities acquisition processes. Analysis also disclosed which activities and events within the integrated systems and facility acquisition process have the greatest impact on the overall MCP schedule. Finally, the model was manipulated and analyzed to identify changes to the MCP and weapons system processes which would favorably impact acquisition schedules.

## IV. Findings and Analysis

The results of the research conducted on facility acquisition as it relates to the development and deployment of new weapon systems are discussed in this chapter. The findings and analysis are presented in four parts along the lines of the methodology described in Chapter III; the literature review, the SLAM model of the integrated facilities and systems acquisition process, and answering the research questions. The overall objective of the research was to find ways to improve the integration of the facility and systems acquisition processes through the use of a simulation model. In this regard, each part of the findings and analysis focuses primarily upon development and analysis of the simulation model.

### The Literature Review

The primary purpose of the literature review was to gain an overall understanding of the systems and facilites acquisition processes which would serve as a basis for the one-line diagram. The literature review did not seek to provide a detailed flow of the integrated facilities and systems acquisition processes, but only to provide a skeletal frame work which could be filled as data were obtained and the research evolved.

Analysis of the literature review revealed that the systems acquisition process occurs in four fairly distinct phases: Concept Exploration; Demonstration and Validation; Full-Scale Development; and Production and Deployment. Transition from one phase to the next occurs as a result of a favorable review at the designated approval level (Air Force Acquisition Review Council (AFSARC), Defense Systems Acquisition Review Council (DSARC), or other). Each systems acquisition is unique and the time required to complete the successive phases varies accordingly. Thus, the systems acquisition process tends to be more event than time oriented.

The facilities acquisition process occurs through four phases: Identification of Requirements; Programming; Design; and Construction as shown on the summary diagram (Appendix A). After needed facilities are identified, the facilities acquisition process must flow through the Military Construction Program (MCP) which is managed and administered independent of the PO. Each project submitted through the MCP channel must achieve several milestone dates which are predicated on the annual PPBS calendar (11). The MCP is thus, time rather than event driven (as was the systems acquisition process).

## The Integrated Facilities and Systems Acquisition Model

The integrated facilities and systems acquisition computer simulation model was constructed by first developing a top level flow diagram (Appendix A) from the literature review and then expanding this simplified network into the full one-line diagram or conceptual model (Appendix B).

The conceptual model was then translated into a computer model using the SLAM simulation language and checked against known times and values to insure that it faithfully represented the actual facilities acquisition process.

This section describes in detail the conceptual model of the integrated facilities and systems acquisition process, and the findings and analysis of the SLAM simulation model and its output. The analysis of the conceptual model includes a discussion of the underlying assumptions and a walk-through description of each activity block in the four phases of facility acquisition. Since the SLAM simulation model is a literal translation of the conceptual model, a step by step description of each activity coded into the simulation language is not provided. Instead, the findings and analysis of the SLAM model are presented in terms of the model verification and validation tests which assured faithfulness to the facility acquisition process. The discussion of the SLAM model then concludes with an analysis of the model's output.

In accordance with the methodology provided in Chapter III, the conceptual model of the integrated facilities and systems acquisition process was constructed as a visual representation of the MCP process as the researchers understood it. This section analyzes the conceptual model (Appendix B) by discussing the process flow of facility projects through the network. It also discusses the assumptions and limitations included in the construction of the conceptual model. These assumptions and limitations were necessary to compensate for insufficient or nonexistent data, the relatively short time available to develop the model, and to stabilize the evolutionary nature of the MCP process. The impact each assumption would have upon the acquisition processes will also be discussed.

General Assumptions and Limitations. This study assumed adherence of the overall facility acquisition process to the network of the conceptual model followed by the concept of a generic weapon system with multiple bed downs. The next two assumptions and limitations addressed concern the tie to the DOD Planning, Programming, and Budgeting System (PPBS) and the environmental impact statement. The final assumption concerns the type of facility projects encountered in the MCP process and the treatment of these projects in the model. An examination of these issues at this point should prove helpful in following the flow and logic of the facilities acquisition process depicted in the conceptual model and in the coding of the simulation model.

The first general assumption concerns adherence to the actual acquisition process. In reality, facilities have not been a stumbling block to system bed down because of the copious employment of work-arounds, temporary measures, and crisis management. Each of these deviations from the basic MCP process could be modeled in SLAM language, but so doing would be contrary to the intent of this research, which seeks to identify permanent rather than expedient solutions.

Therefore, this study assumes that facility projects follow the basic MCP process implicitly.

The first general assumption also specifies that the facilities and systems acquisition processes operate over a period of several years without change. Like the rigid adherence mentioned above, an unchanging acquisition scenario does not exist in reality, indeed several significant changes in the MCP process have been incorporated since this study began (e.g. the Air Staff has significantly changed the procedure for beginning facility design by providing a 2% design instruction in addition to the 35% design instruction referenced in the conceptual model) (33).

The change-free approach to an integrated facilities and systems acquisition process was taken to provide a stable basis for the simulation model. This limited view, however, cannot account for the evolutionary nature of the overall facilities and systems acquisition processes. Thus, the relative applicability of the model depends upon the degree of deviation between the current acquisition process in effect and the conceptual model. Also, this limitation is in keeping with the research objective to analyze the overall processes in effect at the time the research was conducted.

The second general assumption involves the concept of a generic weapon system with multiple bed downs. Under this assumption, intended to simplify the SLAM model, consideration is limited to one generic system deployed with bed downs occurring every year. In reality, however, numerous weapon systems, each with accompanying facility projects, are in various phases of acquisition at any given time (31). Even though the conceptual diagram and subsequent SLAM model do not directly reference the total number of on-going acquisitions, the effect of MCP projects not associated with the modeled weapon system is accounted for in the total number of projects processed. However, statistics were only collected on weapon system projects.

Under the generic weapon system assumption, the facilities acquisition process, and hence the conceptual model, begin with the generic system entering the Production and Deployment Phase and ends with the facilities ready for user occupancy. Facility completion or user occupancy may occur before or after the actual facility need dates generated by the system timelines. The generic system concept also assumes that all facility projects flow through one MAJCOM, one AFRCE, and that the US Army Corps of Engineers (COE) is the design and construction agent for the Air Force.

The next assumption and limitation considers linkages to the PPBS process. Although the PPBS process is the funding avenue for all MCP projects, it is not directly referenced in the conceptual model. Rather, the model is constructed around the assumption that as the facility projects achieve Air Staff milestones they will be automatically included in the POM. This assumption, which simplifies the SLAM coding, is reasonable because Air Staff MCP milestones are established to assure proper integration with PPBS (19). Also, since the

PPBS is relatively fixed and as such is not unique to facility acquisition for new weapon systems, detailed modeling of that process was beyond the scope of this study.

Another consideration, under the PPBS assumption, concerns the process variations that occur as project and design funding requirements cross approval thresholds. Since larger facility projects necessitate increased funding there will be an associated increase in the time required to obtain project approval (31). The conceptual model assumes that these increases in approval time can be effectively included through appropriate time expansion in the affected blocks without the need for detailed examination of each approval channel. The model also assumes funding is available for facility design and thus, does not address non-availability of design funds.

The fourth general assumption concerns the exclusion of environmental impact statements from the conceptual model. While a system's environmental impact can be a stumbling block to facility construction and system bed down, it was not included in this study due to the complexity of the process and insufficient time available for research and data acquisition. Instead, for modeling purposes the facilities encountered were considered to have negligible environmental impact. Under actual conditions, this assumption was adjudged to be essentially valid for new weapon systems which replace existing in place systems (e.g. F-15s replacing F-4s). Appropriate compensation, however, would be required for systems having significant environmental impacts such as the Peacekeeper missile, and for certain facilities such as the hydrazine handling and storage facility for the F-16 aircraft (46).

The types of facility projects encountered in the MCP process form the basis of the final general assumption and limitation. The MCP process addresses two major categories of facility projects: modernization and non-modernization. Modernization projects include barracks, dining halls, administration facilities, etc. while non-modernization projects are more in line with operational needs and include facilities such as: communications centers, aircraft shelters, and weapon system bed down facilities. Weapon system bed down facilities can be further divided into test, training, depot, and operational facilities (42). While the model includes the total effect of all facilities, only technical facilities for weapon system bed down -- a subset of the non-modernization operational facilities -- are tracked.

## Conceptual Model

Analysis of the conceptual model of the integrated systems and facilities acquisition process follows the four phases of facility acquisition identified and discussed in Chapter II: identification of requirements, programming, facility design, and construction. Furthermore, the analysis is presented primarily in terms of the MCP process. Specific elements, or blocks, shown on the conceptual model are referenced by bracketed ([) numbers. Appendix A provides the general flow of the facilities acquisition process and is supplemental to Appendix B in which the entire process is flow charted and presented as a conceptual model. The following discussion analyzes the flow of the facilities acquisition process as it is depicted in the conceptual model. The references shown are to the various blocks of the diagram in Appendix B.

The Requirements Phase [blocks 001 to 107]. The requirements phase of facilities acquisition begins during the Full Scale Development of system acquisition [001]. At the beginning of this phase the system contractor is tasked to provide the Facilities Requirements Plan (FRP) and Facilities Design Criteria (FDC) as required by Data Item Descriptions DI-S-6173 and DI-S-6174 listed in DODD 5000.2 (17). After about 140 days the system contractor produces the first volume of the FRP [102]. The FDC becomes more important during the design phase. The FRP is then reviewed for reasonableness, technical, and functional accuracy by the PO and MAJCOM. The next decision point [103] provides a 15% chance that the PO and MAJCOM require substantial revision to the FRP. The system contractor normally completes this action in about 180 days [104]. In reality, revisions to the FRP and FDC occur throughout the weapon system bed down and can have significant impact, particularly during the design and construction phases (47). For simulation purposes, FRPs were assumed to be produced annually and revised semiannually to support annual weapon systems bed downs.

After required revisions to the FRP are completed, the next step is to determine whether a basing concept and site plan have been formalized [105]. Based upon a typical bed down without major funding or political considerations, an assumption was made that facility siting on the operational base is known 95% of the time (42). Site assignments for the remaining 5% were assumed to be provided within a fifty to ninety day period [106].

The final step of the facilities identification phase is the site survey. After the FRP is finalized, a survey team normally consisting of representatives from the Program Office, MAJCOM and the deployment base visit the proposed bed down location. The team then surveys the existing facilities and determines which ones can be reused and which new facilities must be constructed to support the bed down (46). The model assumes that site surveys will occur annually and that each survey will generate requirements for twenty technical facilities for weapon system bed down [107].

The Programming Phase [blocks 208-231]. After the FRP has been translated by the site surveys into specific require ments for construction at a bed down location, the programming phase begins. The first step in programming occurs as base personnel prepare a DD Form 1391, "Military Construction Project Data", and Project Booklet (PB) for each project identified by the site survey. These 1391s and PBs are the basic programming documents and take thirty to forty-five days for preparation [208] at the base. Base personnel prepare 1391s for all planned MCP projects (41). However, the model does not include any base level work other than the twenty projects identified for the system bed down.

Base personnel forward the completed 1391s (the PB is more applicable to the design phase) to the MAJCOM for review and coordination [209]. In this step, which normally requires seven to 30 days (29), the MAJCOM coordinates the Form 1391 through affected headquarters offices to check for accuracy, and for technical and functional adequacy. These offices include fire, safety, security, and the office of primary responsibility (OPR), etc. (7). A five day period is then assigned to allow base personnel to answer any questions generated by the MAJCOM review and to update the 1391 [210] (8). After the base update is completed, the MAJCOM prepares the final 1391, along with the appropriate cover letters, for transmission to the Air Staff, Engineering and Services Office [211]. This step, which requires from nine to twenty-five days, includes administrative and printing times (29).

At this point in the conceptual model, additional facility projects are entered to simulate the total development effort of all MAJCOMs for the annual MCP program. This includes 210 non-modernization projects [212] and 250 modernization projects [213] (33). These 460 projects, plus the 20 technical projects for weapon system bed down and those projects feeding back into the MAJCOM through feedback node "D" between blocks [208] and [209], constitute the usual 480 to 500 MCP projects submitted annually to the Air Staff (33).

These additional projects are entered to insure that the percentage splits in the programming phase operate efficiently when coded in the SLAM language. They also serve to realistically employ the various resources in the model.

The priority assignment decision block [214] represents each MAJCOM submitting MCP projects to the Air Staff. Twenty percent of the projects are assigned a priority of one which represents urgent, essential and special interest projects. The remaining 80% are uniformly assigned priorities between two and four (31). Where two projects require the same action, the SLAM language is programmed to operate on the one with the highest priority (one is highest) first (35:152).

After the projects are prioritized and prepared for transmission to the Air Staff by the MAJCOMs, they are sorted by the Air Staff call block [215] according to type. This can be either modernization or non-modernization (technical facilities for weapon system bed down are non-modernization facilities). The MAJCOMs must submit modernization projects to the Air Staff by July first [217] and non-modernization projects by November first [216].

Upon receipt of the MCP packages from the MAJCOMs, the Air Staff begins preparation for the Facility Panel (F Panel) review [218], which takes from one to three days (33). The F-Panel, which is composed of representatives from the various directorates within the Air Staff, decide the disposition of each MCP project during this review [219].

Normally 65% of the projects survive the F-Panel review [220]. The projects are sorted [221, 223] and the technical facilities for weapon system bed down rejected by the F-Panel are routed back to the MAJCOM [225] through feedback node "D". These projects are resubmitted in the next year's MCP program (33). The remaining projects are terminated [222, 224]. Actually some of the remaining projects rejected by the F- Panel would also be returned to the responsible MAJCOM for resubmission. In the conceptual model this is not necessary because the 210 non-modernization projects and 250 modernization projects entered annually by blocks [212] and [213] includes those projects which were returned the previous year.

Following the F-Panel review, the Air Staff determines which of the remaining projects require action under Title 10 of the U.S. Code [226]. According to Title 10 of the U.S. Code, Congress must be notified of all projects whose anticipated design fee is over $300,000 prior to advertisment for design services. Approximately 27% of all Air Force MCP projects fall into this category. It takes the Air staff twenty-one to forty-five days to coordinate transmittal of these projects to Congress [227]. Of the projects sent to Congress 5% generate Congressional questions [228]. Answering these questions normally takes from five to twenty-six days [229], and in many instances requires the Air Staff to obtain additional information from the respective MAJCOMs before a satisfactory answer can be provided (33). Congress holds all projects requiring Title 10 action for twenty-one days in addition to the time required for answering any questions [230]. This twenty-one day waiting period is also applicable to those which generated no questions. If the waiting period passes without further questions or comments, the projects requiring Title 10 action rejoin the others. At this point the Air Staff issues design instructions (DIs) to the Air Force Regional Civil Engineers (AFRCEs) to proceed to 35% design [231].

As stated in the Literature Review in Chapter II, design normally commences before programming is complete. Even though the 35% design drawings are also considered significant programming documents and several programming steps remain to be discussed, the major emphasis shifts at this point from programming to design.

Design Phase [blocks 332-363]. The design phase begins when the AFRCE receives the DIs from the Air Staff. Before moving into the design process, however, all projects pass through block [332], an administrative block which splits the projects among the AFRCEs. The conceptual model assumes all of the projects identified in the site surveys [107] go to a single AFRCE along with 20% of the other MCP projects. The remaining 80% of the MCP projects are no longer necessary since only one AFRCE is modeled. They are therefore terminated in block [333].

Nearly 40% of the projects included in the DIs received by the AFRCE require some base level rework before the AFRCE can forward the DI to the design agent [334]. Four to seven days are allowed for the base to revise 1391s and PBs [335].

Then the AFRCE issues a DI to the design agent within three to five days [336]. The AFRCE issues a DI for a minimum of ten projects at a time (39). The Air Force design agent is assumed to be the US Army Corps of Engineers (COE).

After the COE receives a DI from the AFRCE, work proceeds on a parallel track. The top half of the track is selection of the Architect Engineer (AE) firm to complete the facility design which begins with block [337]. The bottom half of the track involves preparation of the preliminary design schedule [340] which takes between twenty and forty-five days (40).

Selection of the AE involves several actions on the part of the COE. First, the Forms 1391 and PBs are analyzed and a synopsis which includes the project location, scope, etc. is prepared to advertise the work in the "Commerce Business Daily" (CBD). This action listed in block [337] takes from ten to nineteen days. Starting on the day the solicitation appears in the CBD, the COE waits thirty days, closes the invitation and evaluates the AE firms which have responded [338]. During the evaluation process, the COE narrows the list of interested AEs to the ones best qualified to complete the work based on special experience, DOD experience, capability to perform the work, and location of the firm. This evaluation process can take an additional twenty-five days. Thus, the total time listed in block [338] is from thirty to fifty-five days. The next action [339], which is about twelve days in duration, consists of a pre-selection board followed by a selection board which identifies three firms ranked in order of preference. Selection is made at the COE district level and does not necessarily constitute approval authority (40).

The parallel tracking mentioned above terminates in an administrative block [341] which holds the projects until both the AE selection is made and the design schedule is prepared. When the conditions specified in block [341] are satisfied, the COE makes a final AE selection and issues a notice to proceed (NTP) [342]. The sixty to 120 days prior to the NTP are based on the time required to review the design criteria with the selected AE; time for fee negotiations; time for an audit of AE firms where the negotiated fee is greater than $200,000; and time to obtain approval when it is beyond the district engineer's authority. The district has approval authority when the AE fee is less than $200,000. AE selection must be approved at the COE division level for fees between $200,000 and $500,000 (25).

The AE normally completes the 30% design and returns it to the COE within sixty to 120 days after receiving the NTP from the COE [343]. An original estimate for completing the 30% design, which is the first visual representation of the PB and FDC, was thirty to forty-five days (40). This time was re-evaluated and raised to sixty to 120 days based upon COE experience with PBs and FDC for technical facilities for unfielded weapon systems which contained numerous errors and omissions. After the COE receives the 30% design three days were allotted for distribution through review channels [344].

In addition to its own review, the COE transmits the 30% designs to the AFRCE, MAJCOM, and host base for functional reviews. During these reviews, which take about forty-five days [345], the drawings are checked against the PBs and FDC to insure the project concepts, drawings, outline specifications, and initial cost estimates are both complete and correct. After the reviews are complete, four to twelve days are required for the AFRCE to compile and transmit the comments to the COE [346]. The COE and AFRCE then conduct a design review meeting over a one to two day period to insure that each of the comments are understandable and valid [47]. After the review meeting the COE reformats the comments (this is necessary for organization and to prevent duplication of comments) and forwards them within five to fifteen days to the AE for inclusion in the 30% design. The AE normally takes twenty to thirty days to include the comments and turn a new set of drawings over to the COE [349]. This set of drawings is referred to as the 35% drawings (40).

After the AFRCE receives the 35% cost estimate from the COE, an AF Form 1178/1178a, Project Cost Estimate Work Sheet (PCE), is prepared and forwarded to HQ USAF MCP Program Management Branch (LEECC). Its purpose is to provide HQ USAF with a clear description of the project and an accurate cost analysis (12:A-1). The PCE, which takes in-house AFRCE personnel three to seven days to prepare and transmit [350], is basically a programming document. At this point the design process essentially reverts back to a programming effort.

Block [351] of the conceptual model is the 35% milestone. All 35% designs (signified by a completed PCE) must be at HQ USAF between August and November for inclusion in the PPBS via the Budget Estimation Submission (BES). Congress and OSD consider this milestone important because it indicates the cost estimate has a valid basis and the project will most likely be ready for construction when the appropriations are released (33). After LEECC reviews the PCE for adequacy, the project is forwarded to OSD [352] on 15 September in the BES. Sixty days are allowed in block [353] for OSD to review and validate the project for submission in the President's budget and transmit the approved project listing back to LEECC.

After LEECC reviews the listing of projects OSD has approved, 100% DIs are issued. The outcome of the OSD review is reflected in decision block [353] where LEECC issues a 100% DI for 95% of all projects which were previously transmitted to OSD (31). For purposes of simulation the remaining 5% of the projects are terminated in block [354]. In reality, however, these projects are normally sent back to the MAJCOMs for futher action. Since DIs are issued electronically, a SLAM gate was used to simulate issuing 100% DIs to the AFRCE in groups of ten to fifteen [355].

Upon release of the DIs the conceptual model breaks into two parallel paths. One path continues with programming through the PPBS and Congressional budget enactment while the other moves again to the design phase. The activities on both paths must be complete before the start of construction.

Following along the programming path, block [356] is the first encountered. This block is an amalgamation of several relatively fixed activities which include preparation of the Program Budget Decisions and preparation of the President's Budget for presentation fifteen days after Congress convenes in January. It also includes the variable time associated with Congressional review and approval of the Military Construction Bill (Milcon) typically in late spring or early summer. Decision block [357] represents Congressional approval of 95% of the projects in the Milcon bill for funding while the remaining 5% are terminated. After Congress passes the Milcon bill, block [358] allows ninety days to complete the budget enactment process and for funds to reach the construction contracting office. Block [358] also ends the programming phase of the facilities acquisition process (33).

Having completed the programming phase, the projects move again to the design phase in block [359]. After the 100% DIs transmitted from LEECC [355] reach the COE, the AE is allowed to proceed to 95% design. This process, which takes between 100 and 200 days, may be cancelled if the project is terminated by Congressional action [360].

Upon receipt of the 95% design, the COE conducts a review over a fifteen to thirty day period and forwards comments to the AE [361]. The AE then normally requires fifteen to thirty days to incorporate the comments and return the completed design to the COE [362]. Once the COE has the completed design, it performs a fifteen to twenty-five day backcheck and notifies the AFRCE that the project design work is complete [363], thus ending the design phase (40).

Construction Phase [464-471]. Once the AFRCE recieves notification that the designs are complete, it must wait for HQ USAF authorization, funding and the beginning of the new fiscal year (FY) before advertising the construction project [464-465]. After the AFRCE receives authorization to proceed, funds are transferred to the COE for contracting purposes. The COE normally requires forty-five to sixty days to prepare and advertise the contract in the CBD [466]. Each prospective contractor submits a sealed bid. After these bids are opened, another five to fifteen days are needed to certify the contractor and his bid and to award the contract [467]. The COE contracting officer then meets with the new contractor to coordinate the rules of the contract and to insure that any questions the contractor has are answered. After a seven to twenty-one day period the contractor is issued a notice to proceed (NTP) and construction begins [468] (40).

Construction projects for technical facilities for weapon system bed downs require one to two years (365 to 730 days listed in block [469]) for completion depending on the size and complexity (21). On occasion, construction projects will require several additional years. However, projects of this magnitude were considered rare and not included in the model. In addition to time specified in the construction contract, changes and modifications to the work may add up to 120 days [470]. After construction is complete, the user occupies the facility signifying the end of the construction phase [471].

Initial Operating Capability. The final block on the conceptual model represents Initial Operational Capability (IOC) [572]. For the conceptual model five years plus up to 365 days are allowed from the beginning of FSD in block [001] to IOC (46), which terminates the integrated system and facilities acquisition process, based on AFSC/DEP experience (2).

Forecasting IOCs involves a high probability of risk for several reasons. First, the system acquisition process operates in an environment of emerging technologies, uncertainties, and changing needs in the Air Force mission (30:32). In addition, any phase may require repetition or additional time before the next phase begins, and the system is vulnerable to cancellation at any of several reviews. "Consequently the system acquisition process or cycle must be flexible to the fact that every system development is unique (30:32)". While this flexibility is needed to minimize the risk of fielding a system with operational deficiencies, there is a corresponding risk that changes in the IOC will occur. Changes in the political climate and estimated threat may also have a significant impact on IOC.

## Findings and Analysis of the Simulation Model

Simulation languages are used to build models which simulate real processes or systems occurring in industrial, social, governmental, and other organizations. The processes range from car washes to world population growth (35:12-13). Once a model is proven to be a faithful representation of a real process, it can be manipulated to simulate and forecast the result of changes to the process where actual changes for test purposes may not be practical, desirable, or possible.

The Air Force uses simulation models in both research and development and operational scenarios. However, there are considerable differences between the simulation tools. For example, many research and development simulations are coded directly in FORTRAN language, while operational processes are typically coded in a FORTRAN based simulation language. This research focused on an operational application of the FORTRAN based SLAM simulation language. The Air Force has developed a number of simulation models to analyze activities such as airfield operations and supply inventory control. The literature review indicated, though, that this research may be the first attempt to apply simulation techniques to the facilities acquisition process.

When the conceptual model of the integrated facilities and systems acquisition process was first coded into SLAM language it contained 539 lines of code. This initial coding was expanded to the 862 lines of code listed in Appendix C through the iterative process of verifying, validating, checking output and making adjustments. This section discusses the findings and analysis of the SLAM model in terms of verification, validation, model output. A detailed analysis of each adjustment is not provided. However, a general description of the types of adjustments made and the problems encountered in developing the SLAM code is included.

Verification. A complete listing of the computer code used to verify and validate the systems and facilities acquisition model is provided in Appendix C. As mentioned above, the program is quite long and a line by line description would be both tedious and repetitious of the material presented in the discussion of the conceptual model. The program is, however, documented so that the novice programmer with some knowledge of the SLAM simulation language can track the logic of each step in the model.

Once the computer code for the simulation model was developed, it was necessary to complete a two step verification process. The first step was to insure that the conceptual model or one-line diagram (Appendix B) was correctly implemented in the computer code. Second, the input parameters and logic structure of the computer code were verified with representatives of the various organizations included in the model (3:267).

Accomplishing the first step in the verification process required that the computer code be compared line by line with the flow of activity depicted on the conceptual model. Each decision point was carefully examined to insure the correct choices were available and the percentage of projects assigned each choice was correct. It was also necessary to calculate the number of projects each activity would encounter on a yearly basis to insure that proper workloads were assigned. For example, an oversight in an early version of the model caused nine AFRCE project managers to attempt to process over 500 projects per year to the COE. The addition of a simple sort routine reduced the number of projects to a more reasonable workload of sixty to ninety per year (39).

During this first step of the verification process nearly 200 lines of code were added to the model. While some were merely comments and additional information to help future programmers understand the program's logic, many were corrections to activity flow, logic and resource assignments.

Once confident that the model accurately represented the activity flow of the conceptual model, the next step was to review logic and input information. Each activity which had a time period or a conditional sorting routine involved was carefully examined. Times for activities were again verified with individuals working in the organizations associated with the activity. For example, the times associated with HQ USAF programming activities were verified with HQ USAF/LEECC (33); base level programming activities with base level programmers (27); and AE selection activities with the Army Corps of Engineers in Baltimore (32). Following this review the appropriate adjustments were made in the computer code and the program again grew by nearly 200 lines.

At this point verification of the model was complete and it was ready to validate against the real system. It must be kept in mind, however, that verification and validation are iterative processes and the model made several passes through each before reaching an acceptable level of credibility.

Validation. While model verification dealt primarily with the computer code and the conceptual model, validation is achieved by comparing model output to the performance of the real system. For the purpose of this study the performance of the real system was equated to the MCP cycle discussed in Chapter I and depicted in Figure 1. Selection of the five year time period seemed justified on the basis that it is accepted and briefed at all levels of DOD. While the MCP cycle shown in Figure 1 is somewhat idealistic (2), the model could be made to perform in a similarly idealistic manner.

Thus, the model as it appears in Appendix C includes statements which prevent the projects generated for the support of the weapons system from being delayed by siting decisions, poor requirements documents, or design/construction changes. It should be noted that this version of the model is solely for the purpose of verifying and validating the computer code and therefore represents an ideal MCP process much like that of Figure 1.

The first step in output validation was to determine the time period required by the model to warm-up or to become stable. Thus, the model was run for a period of eleven years and the values of average project completion time were plotted (Figure 2). Based upon the plot of Figure 2 the model seemed to stabilize around the sixth year. Examination of file and activity statistics for the first five years of the simulation revealed that almost no activity was occurring in the later parts of design or construction. In fact, the first project completed took 1,000 days and occurred in the third year. Twenty-one projects were completed in the first

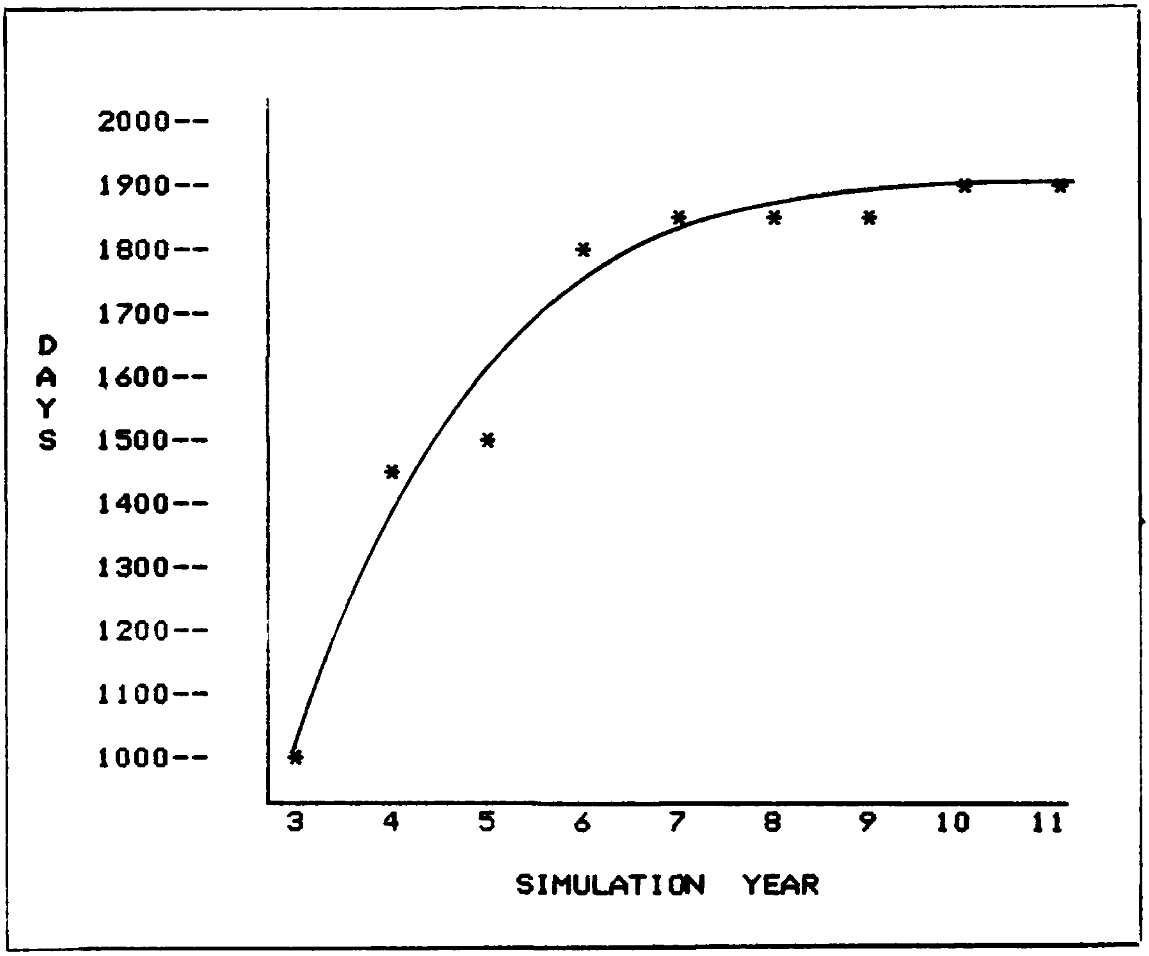



Figure 2. Project Completion Time vs. Year of Simulation

six years, eighteen of these in year six, with an average completion time of 1,680 days. Thus, the warm-up period was established at the six year point and all model output prior to year seven discarded.

Next it was necessary to establish the number of years the simulation should be run to obtain an output within a 95% confidence interval. Based upon the relative smoothness of the curve in Figure 2, a run period of sixteen years was selected with statistics collected in the last ten years. The complete output of this simulation run is contained in Appendix C following the program listing. For the purpose of

Table I

Average Project Time to Completion in Specified FY

| Year | Time Complete (Days) |
|---|---|
| 7 | 1830 |
| 8 | 1780 |
| 9 | 1840 |
| 10 | 1920 |
| 11 | 1920 |
| 12 | 1890 |
| 13 | 1820 |
| 14 | 1850 |
| 15 | 1800 |
| 16 | 1890 |

Mean = $\bar{X}$ = 1,854 Days

Std. Dev. = S = 49 Days

checking the output confidence interval, the time complete statistic from the SLAM summary report is the statistic of interest. Table I provides a summary of the time complete statistic, its mean and standard deviation.

Based upon the values in Table I and the Students t value for a 95% confidence interval (i.e. 2 1/2% high or low) the error is calculated by: $E = t_{CRIT} * S / (n)^{1/2}$ . The number of repetitions required to achieve a 95% confidence interval is: $n = (t_{CRIT})^2 * S^2 / (E^2)$ . Performing these calculations yields a value of ten for the number of repetitions required to insure a 95% confidence interval about the mean of the model's output. Therefore, the assumption that a sixteen year simulation run with statistics collected for the last ten years was valid (18:259).

The final test of model validity was a comparison of the average model output ($\overline{X}$ from Table I) to the five year MCP cycle (Figure 1). The hypothesis for this test is that the average output $\overline{X}$ is equal to the actual mean ($\overline{X}_A$) or 1,825 days, the five year MCP cycle. Again, a 95% confidence level is desired so there will be a 5% rejection region. Assuming that the individual project completions are normally and independently distributed the Students "t" test can again be used. The value of t to be used for comparison is calculated as $t_C = (\overline{X} - 1{,}825) / (S / n^{1/2})$ which yields $t_C = 1.87$. The critical value of $t_{CRIT}$ for a two tailed test is 2.26 (18:259). Since $t_C$ is less than $t_{CRIT}$, the hypothesis that $\overline{X} = \overline{X}_A$ or 1,825 days cannot be rejected (18:259).

Thus, it can be concluded with a 95% level of confidence that the hypothesis will not be rejected. However, this is considered a weak test unless the hypothesis is rejected. The power of the test must also be checked. The power of a test is the probability of rejecting the hypothesis when in fact it is false. Based upon the 5% rejection region from the Students "t" test and the ratio of the difference between $\bar{X}$ and the five year MCP to the standard deviation S, a value for the power of the test of .15 can be determined from power curves (18:264). Since the power of the test is small it can now be concluded that accepting the hypothesis that $\bar{X} = 1{,}825$ and therefore that the model is valid is a strong conclusion. Based upon these statistics the probability of accepting the model when it is false is 15% and the probability of rejecting it as invalid when it is in fact valid is 5%.

Further checks for model validity were made on the values for the mean time issuing the Design Instruction and the mean time to 30% design. The results of both tests were similar to those discussed above. It was therefore concluded that the model could be accepted as an accurate representation of the MCP process. These statistics and the accompanying histograms (Appendix C) were not included in subsequent simulations since they served no useful purpose beyond verification and validation of the model. For example, monitoring "others complete", "DI other AFRCEs", "DI other Programs" and the "priority of other projects" was done only to insure that these parts of the model were working as planned.

The file and activity statistics included in Appendix C were obtained on other simulation runs to insure that changes to the model did not adversely affect the flow of activity, but are not included in this report since they also are of little value beyond verification and validation.

A brief discussion on the meaning of resource statistics will serve to conclude this section of the report. The SLAM summary report for each year monitored (Appendix C) provides statistics on resource utilization. For example, in the seventh year of the simulation the average utilzation for LEECD is shown as 1.34 of the five available resources or 27%, while the AFRCE shows a utilization of 5.43 of nine or 60%. The low utilization of manpower in LEECD does not imply that the organization is overmanned. The average utilization figures only account for time spent directly involved with the MCP. Since the AFRCE and COE are not likely to be involved in construction or civil engineering work other than MCP, their utilization is much higher than the other organizations.

Model Output. The computer code and the SLAM output for three of the simulation runs accomplished in this study are included in the appendices. Appendix C contains the computer code and output for the verification/validation model (idealized model) discussed above. Appendix D contains the simulation program and output for the model of the integrated systems and facitities acquisition process. Appendix F contains the program and output for the process modified to allow the systems contractor to accomplish facility design.

The SLAM Summary Report, which immediately follows the simulation program in each of the three appendices, displays the statistical results of each simulation run. The report begins with a general section which identifies the project, the run number, the simulated time for the statistics and the time the statistics were last cleared. This general section is followed by the statistical results of the simulation categorized by type. A definition of the statistics included in the SLAM Summary Report and a brief explanation of each value is included as Appendix G for the reader interested in reviewing the output of the simulation models.

Integrated Systems and Facilities Acquisition Model. Once the model was verified and validated, it was modified to permit delays in the processing of projects. The first potential for delay encountered by a project passing through the system was a 15% chance that its facility requirements plan was not sufficiently complete to permit programming and subsequent design of the project (46). Projects experiencing this delay could also be those which experience delay during design or setbacks in the programming cycle. The second delay encountered was a 5% chance that a construction site had not been identified. A project experiencing both of these delays could be set back as much as nine months before even starting through the programming cycle. The third delay was a 35% chance of non-acceptance by the F-Panel, in which case the project was sent back to the MAJCOM for rework or reprogramming. The final delay was that of potential construction changes. Each project was given a 60% chance of experiencing a contract change during construction, which would cause a delay in project completion. Delays ranged from ten to 120 days per change with some projects receiving as many as three changes (39). The revised model and its output are included in Appendix D.

As mentioned earlier, the model used in the verification and validation processes was actually a constrained version of the integrated systems and facilities acquisition model and was intended to represent the ideal acquisition. Reintroduction of the problems often experienced in facility acquisition changes not only the model's output, but the basis of its validity.

The output of the integrated system and facility acquisition model cannot be validated against briefing charts or ideal acquisition cycles. It can be expected to generate some completion times within statistical range of the accepted ideal, but should not be considered invalid because its average output is well beyond the ideal range. The statistical tests performed on the verification/validation version of the model have little meaning when performed on the integrated systems and facilities acquisition model unless reliable values for the completion time at each phase of the acquisition process are obtained. The fact that the type of information needed for comparison normally is not recorded prevented a quantitative analysis of validity.

Banks and Carson (3) discuss modeling situations in which the data needed for statistically testing model validity is unavailable or unreliable. They suggest that the use of expert opinion as to the validity of the model's output is equally acceptable in these situations. Therefore, the range of values and expected average values for each phase of the modeled process was reviewed with representatives of Air Force Systems Command (2), HQ USAF/LEEPD (33), the Army Corps of Engineers (32) and facility engineers from ASD/DE (43). In all cases the reviewers felt the output was a reasonable representation of the acquisition process.

The fact that the integrated systems and facility acquisition model varies only in its potential for delay from the idealized model makes this subjective test of validity less disturbing. Since the validity of the idealized model was tested and proven, then the integrated systems and facilities model is also valid if changes were correctly implemented (3:387-389). The question of correctness of logic is one of verification and each change was verified through the process previously discussed. Thus, on this base the output of the integrated systems and facilities acquisition model was accepted as valid.

The model was run for a simulation period of sixteen years with a six year stabilization period. As with the verification/validation model, this time period was established as adequate to establish the systems performance within a 95% confidence interval. The mean time for project completion was calculated as 1,981 days with a standard deviation of forty-eight days. The range of completion times was from 1,600 to 2,600 days. The mean time for projects to reach 30% design was 579 days and the mean time for issue of the design instruction (DI) was 395.

The summary report for the model also plotted a histogram for the project delivery status. The completion time of each weapon system project was compared to an assigned IOC related need date. The need dates were assigned in a range between five and one half to six years from project initiation. The histogram reflects an average of 25% of the projects would not be complete in time for IOC. In some years as many as 40% of the projects were late.

Comparing the percentage of late projects in this model to the output of the idealized model shows an increase of 15% in the number of late projects. Based upon the fact that facilities have never caused a delay in IOC, the model's output implies that about 25% of all weapons system projects receive special management attention. Based upon discussions with HQ USAF (33) and Corps of Engineers' representatives (40), this output statistic and the conclusion that numerous weapons systems projects receive special attention and processing to make up lost time are accurate.

Model With Altered Resources. The second simulation involved using the integrated systems and facilities model in eleven separate simulation runs. In each run the available resources were altered. Three types of alterations were made. First, the four most critical resources in the model (the personnel in COE, AFRCE, MAJCOM and LEE) were increased by a factor of two. The increases were accomplished one organization at a time. Then all organizational personnel levels were doubled. When all four organizations were doubled in size, all other resources had to be doubled to prevent overloading other organizations.

The second type of alterations involved decreasing resources in the four critical organizations by a factor of two. The simulated force reduction was accomplished in the same manner as the increases.

The output from these simulations is not included in the report due to the volume of the model output. The findings of the simulations do, however, warrant some discussion. The doubling of one of the four organizations mentioned above had no impact on the average project completion time. Increasing the COE staff for example, caused the workload (projects waiting for service), of the AFRCE and MAJCOM to increase by 30%. The average completion time for projects was found to be 1,971 days, which was not significantly different from the average time of the unchanged model.

Similar results were experienced when each of the other resources was increased. Doubling all of the resources also resulted in a relatively small decrease in completion time. In this case the average completion time dropped to 1,900 days. However, the standard deviation of ninety-eight days recorded made it statistically questionable whether the change resulted in a true decrease in model output. When the resources were all increased to 100 the average project completion time dropped to 1,800 days with a standard deviation of thirty-nine days. Reviewing the file statistics provided in the model's summary report reflected a total absence of projects waiting for service. Thus, the 180 day decrease in time required for project completion is a reflection of the time spent waiting for an individual or organization to accomplish a task.

The simulations representing decreased resources provided a more dramatic result. In all cases the model was unable to complete the sixteen year run due to overloading of the model's filing system. The size of the files could have been increased but the result would have been the same. The reason for file overloading was evident All available resources were employed 100% of the time starting in the fifth year of the simulation. Once the 100% utilization level was reached, the backlog of work began to increase rapidly. Increasing file size would only have delayed model overload as the system had no chance of recovering unless no new projects were added to the system.

Weapons System Contractor as Facility Designer. The final simulation run accomplished placed responsibility for facility design with the weapons system contractor. Since this change was considerably more complex than that of altering resources it was necessary to first develop a conceptual model (Appendix E) to determine the new flow of projects through the system. The computer code of the integrated systems and facilities model was then altered to reflect the flow diagrammed in the conceptual. The resulting model and its output is included as Appendix F.

The principal change in the acquisition process involved having the systems contractor select an AE firm to accomplish design while the Air Force accomplished the early stages of programming. The AE was then permitted to start the design at the same time DD Forms 1391 were forwarded to HQ USAF. Design was allowed to continue to 30% but forced to wait for Facility Panel (F-Panel) approval of the project before continuing. At this point the 35% design cost estimate was forwarded to LEECC and design continued to 95%. Once 95% design was achieved, the simulation program reverted to the original model's project flow. This change in project processing was accomplished primarily by the addition of the code in Model Segment H (Appendix F).

The model as modified still contains all the potential delays described in the integrated systems and facilities acquisition model. However, the average project completion time decreased by 400 days. In fact, the average completion time of this modified model was 277 days less than the ideal MCP cycle modeled in the verification/validation simulation.

Analysis of the output statistics show that the average time for a project to reach 30% design under the modified system was within forty days of the completion of project programming. It was noted in previous runs of the integrated systems and facilities model that the largest delay periods occurred between programming and forwarding the 35% cost estimate to Congress. Under the modified system the simulated project could be programmed and meet the date for BES submission in the same year. This would clearly be an advantage over the current process.

A few added limitations must be considered under this system. For example, the Corps of Engineers remained responsible for design. Based upon information provided by the various organizations involved in the current process, the Air Force does not have the manpower or the organizational structure required to perform the services now assigned to the Corps. Thus, wholesale or unqualified inclusion of projects in an acquisition process such as the one simulated would soon overtax the available resources in the COE or the Air Force. The expected result would be that managers in both agencies would give special attention to certain projects much as they do under the current acquisition process.

## Answering the Research Questions

This final section of Chapter IV, Findings and Analysis, provides answers to the research questions propounded in Chapter I. These questions were developed in support of the overall research objective to identify potential changes in the facilities acquisition process which would allow more effective integration with the acquisition of weapon systems. In consideration of the building block approach to research described at the beginning of this chapter, the answers to the four research questions are dependent on the findings and analysis of each preceding section of this chapter. This section is divided into four parts which begin with a restatement of the research question under consideration. The answers to the research questions form the basis of the conclusions and recommendations presented in the next chapter.

Research Question 1. What events or activities in the weapon systems acquisition process trigger events or activities in the facility acquisition process?

The research identified four key events and activities in the systems acquisition process which triggered responses in the facilities acquisition process: entering Full Scale Development (FSD) and the initiation of the Facility Requirements Plan (FRP) and the Facility Design Criteria (FDC), the basing decision and deployment planning (including Integrated Logistics Support (ILS) planning), refinement and evolution of system design and mission capabilities, and date and definition of initial operational capability (9). While the following discussion describes each of these four motivators, their overall effect on the facilities acquisition process is further explored in research question two.

When system acquisition enters Full Scale Development (FSD), facilities definition begins in earnest with the initiation of the Facility Requirements Plan (FRP) and the Facility Design Criteria (FDC). These two contract documents form the backbone of MCP programming and later of facility design by providing the various engineering parameters of the facilities required to support the weapon system.

A records review (36) of the KC-10 advanced tanker program supports the finding that only limited product division facilities planning occurred before the system contractor was selected and directed to proceed with preparation of the FRP and FDC. The product division civil engineer presentation in the Intermediate Program Management Course (SYS400) at Wright-Patterson AFB (46) also indicates that civil engineering efforts are normally a reaction to events in the program office. This type of facility support is consistent with the traditional civil engineering philosophy where the civil engineer waits for a user or requestor generated facility need before responding.

The second motivator in the system development process is deployment planning (including ILS planning) and the basing concept. This information -- which describes the scope of system deployment -- maintenance concept, and basing locations, is critical to effective facility planning since the requirements at each operational location will result in a unique mix of new and renovation projects for facilities.

The following two examples indicate the types of problems which may result from inadequate deployment and basing concepts. First, proper identification of facility requirements to support a mission change from C-130 to C-141 aircraft at Andrews AFB indicated that problems induced by an inadequate definition of the maintenance concept may continue throughout the life cycle of the weapon system (27). In addition, the KC-10 records review (36) indicated that HQ USAF is reluctant to program for facilities before a firm basing decision is reached.

Technological evolution and refinement of the mission capability can significantly change the scope of the facilities required to support a particular weapon system. These changes, which may precipitate changes in ILS planning, are normally incorporated into revisions of the FRP and FDC. Their impact is usually most noticeable in the design and construction phases. However, if the change in scope of a particular project exceeds programming margins, the entire facility project may revert back to the beginning of the programming phase.

The final motivator is date and definition of Initial Operating Capability (IOC). These events may be politically inspired or result from actual or perceived foreign threat. The definition of IOC may range from one element of the system fielded (e.g. one aircraft, one missile, or one radar unit) to a full operational squadron or wing on alert. The date may be set with ample time for facility acquisition to flow through the normal MCP process, or with a suspense so short that maximum compression of the MCP cycle would not be responsive. Given the large possible variations in IOC timing, this research project assumed IOC would occur five to six years after beginning FSD, based projections by Air Force Systems Command programmers (AFSC/DEP) (2).

Research Question 2. What are the interrelationships and conflicts associated with the two processes?

The research indicated that the key motivators identified in question one also formed the primary interface points between the systems and facilities acquisition processes. Following this understanding, the four motivators discussed in question one will be readdressed from the perspective of the conceptual model in Appendix B and the SLAM model output in Appendices C and D.

The conceptual model (Appendix B) indicates that the facilities acquisition process is dependent on the first motivator (initiation of the FRP and FDC documents after entering the full scale development phase). The following discussion indicates how each of these documents affects the overall timing of the facilities acquisition process.

From the conceptual model it is apparent that the programming phase which begins with base level preparation of programming documents in block [208] cannot start until the requirements phase, which culminates in the FRP, is complete. Once the facility requirements have been completed in the FRP, the facility project flows through the MCP process in a way similar to any other non-systems related construction project. For system acquisitions which have a significant facilities impact, such as the generic system modeled, preparation and review of the FRP may add over a year to the basic MCP process. In addition, if completion of the FRP precludes sufficient programming time to meet the HQ USAF August call for 35% PCEs (block [351]) the facility acquisition process may be delayed an additional year.

Initiation of the programming phase of facilities acquisition is not dependent on completion of the FDC. However, this document can add considerable time to the facility design process. An original estimate of thirty to forty-five days for completion of the 30% concept designs (40) was raised to sixty to 120 days (block [343]) (32) based on the risks associated with omissions, errors, and changes in the FDC. As with the FRP, if the increased times resulting from deficiencies in the FDC cause the project to miss the August first HQ USAF call for PCEs, the facility acquisition process may be delayed. Design of support facilities for the B-1 bomber which has been delayed for upto nine months (41) is an example of an FDC induced delay. Deficiencies identified in the FDC during the construction phase will extend the time the contractor requires to complete the facility [470].

The second motivator identified in question one concerned the basing decision and deployment planning which included ILS planning. The conceptual model assumes that the basing decision is confirmed before the FRP is completed. In reality, if the basing decision is not finalized the site surveys (block [107]) which precede the programming phase cannot be completed. Efforts to program facilities based on the FRP or other facility listings before the basing decision is confirmed may be only marginally successful. This concept is supported by the records review of the KC-10 program (36) which indicated that while the gaining command had submitted projects as programming line items before the FRP was completed, the projects were subsequently rejected because a firm basing decision had not been reached.

The conceptual model also assumes that deployment and ILS planning were completed before conducting the site surveys. The deployment and ILS planning information, which directly impacts the number of construction projects at a particular location, is essential to both the programming phase and design phase.

Deficiencies in deployment and ILS planning can delay the programming phase. First, the results of the site survey indicate which requirements on the FRP can be satisfied by reusing existing facilities and which ones require total new construction. The programming phase then requires preparation of separate programming documents for each project identified during the site surveys.

Deficiencies in deployment and ILS planning may include unknown facility requirements and changes in facility scope that necessitate complete re-accomplishment of the facility acquisition process beginning with the site survey.

Deficiencies in the deployment and ILS planning have an effect on the design phase similar to their effect on the programming phase. As these deficiencies are disclosed, any design work already completed must be corrected. Depending on the severity of the required changes the design process may revert to the beginning of the concept designs (block

[343]) or in cases where complete facilities were omitted, the AE selection process may need to be reaccomplished (block [337]). Deficiencies in deployment and ILS planning, as well as in the basing decision, affect the overall facilities acquisition process in much the same way as problems with the FRP and FDC. These deficiencies may cause the 35% concept designs to miss the August first gate which could result in project slippage of upto several years. Deficiencies identified during the construction phase will also require additional time for correction or reaccomplishment of part of the construction (block [470]).

The third motivator concerned refinement and evolution of system design and mission capabilities. As a weapon system progresses through the system acquisition cycle new uses and requirements emerge as a result of technological growth and changes in the mission employment scenario. These alterations may result in changes to the FDC and an expansion of the FRP, along with corresponding changes in the basing concept and deployment plans. In turn, respective impacts on the facilities acquisition process will occur.

The final motivator to be discussed is IOC definition and date. As previously stated, the definition and date of IOC may vary considerably. This would also result in considerable variation in the level of facility acquisition activity required to support IOC. For simulation purposes, IOC was described as a requirement for twenty facilities with five years plus up to 365 days from entering full scale development and initiation of the FRP and FDC. During the time interval, each of the facilities had to pass through the four phases of facility acquisition shown in the conceptual model. The output of the SLAM simulation model indicated that with no changes in the construction phase only 75% of the facilities would be available at IOC. With construction changes this number dropped to 35%. These numbers support Hansen's thesis that facilities would be a binding constraint on achieving IOC (24).

Research Question 3. Who are the key players and what are their roles and responsibilities?

The key players in the facilities acquisition process described on the conceptual model (Appendix B) can be broken into three basic categories: first, those making decisions concerning the operational deployment and employment scenario which consists primarily of personnel from the gaining MAJCOM, HQ USAF and OSD: next, those intrinsic to the program office, which would include the system contractor, the facility engineer assigned to the program office, and the ILS division of the program office; the third category includes those players directly associated with the MCP aspects of facilities acquisition. This last category includes, base level engineering, gaining MAJCOM civil engineering, HQ USAF, the AFRCE, the Army Corps of Engineers, the construction contractor, OSD and Congress. These three categories are not all-inclusive, but contain those players most directly affecting facilities acquisition.

The information discussed in this section is primarily applicable to the systems acquisition process within ASD. However, the basic ideas are typical of each of the product divisions. The order of discussion of the various players does not necessarily follow the facility acquisition process.

The first general category of key players includes those making decisions concerning the deployment and employment of the new system at the operational locations. The primary roles and responsibilities of this group, which includes personnel from the gaining MAJCOM, HQ USAF and OSD, is to develop the basing concepts and IOCs. This information determines where the facilities must be constructed and when they must be ready for occupancy. Also depending on the number of units of the weapon system scheduled for bed down at a particular base, it also determines the mix between new and existing facilities necessary to fulfill mission support requirements. Since this research did not address the process by which the MAJCOM, HQ USAF, and OSD personnel reach basing and deployment decisions, that decision process is not discussed nor was it modeled.

The roles and responsibilities of the system contractor, ILS division, and facility engineer constitute the second general category. The system contractor and ILS division impact the facility acquisition process along two primary lines. The first of these lines is production of the

Facility Requirements Plan (FRP) and Facility Design Criteria (FDC) along with any subsequent changes. The second line involves the process of developing operational deployment plans. While facilities are an element of ILS, the facilities engineer working in a particular program office may not be functionally assigned to the ILS division. The roles and responsibilities of the facility engineer are discussed as a separate item of ILS.

As the system is developed, the system contractor gathers information on the types of support facilities required and quantitative descriptions of any special system and facility interfaces. This system generated data is then integrated with data describing government provided support equipment and maintenance requirements provided by the ILS branch. From this integrated data bank the system contractor develops the FRP and FDC. The system contractor also revises the FRP and FDC to incorporate system and program induced changes.

The ILS branch and the system contractor also play key roles from a facilities perspective during deployment planning. A significant facility impact occurs as the maintenance element of the ILS branch decides what level of maintenance will be provided at the operational location and alternately, which maintenance requirements will be supported at depot level. The system contractor helps define facility acquisition during deployment planning by providing individual listings of the facilities required to support each specific bed down of the new system (i.e. the facility requirements for bedding down two fighter squadrons differ from those to bed down one squadron).

The facility engineer is the member of the program office most directly affecting facilities acquisition. According to ASD/DE prepared literature (46), the facility engineer prepares inputs to the program management plan (PMP), the contractor's statement of work (SOW) and deployment plans, and he participates in source selection. He is also responsible for review and coordination of the the FRP and FDC and other facilities related documents which the system contractor prepares. The facility engineer acts as a liaison between the MCP cycle and the program office. However, his responsibility does not extend beyond the requirements phase of facility acquisition.

Other roles and responsibilities of the facility engineer include reviewing proposed system changes and support equipment proposals for facility impact and participating in resolution of facility to system interface problems. The facility engineer also reviews concept designs for functional adequacy, monitors progress in the MCP cycle, and forecasts potential facility conflicts with IOC and other system milestones. In addition, the facility engineer along with system contractor, base level, MAJCOM, and other ILS personnel conduct the site surveys.

Concerning system development, the facility engineer primarily responds to system and ILS generated facility requirements and provides only limited input into shaping system and equipment profiles to conform to the parameters imposed by existing facilities (43). As a result, the systems may be developed and equipment proposed or selected with little prior assessment of the impact on the facilities acquisition process.

The third category includes those players most responsible for the MCP cycle embedded in facilities acquisition process. This category includes base level civil engineering, gaining MAJCOM civil engineering, HQ USAF, the AFRCE, the U.S. Army Corps of Engineers, the AE and construction contractor, OSD and Congress.

After the facility requirements have been identified and the basing concept confirmed, base level civil engineers participate in the site surveys. From these surveys, the base engineers prepare a DD Form 1391, "Military Construction Project Data," and a project booklet for each facility required. After these programming documents are forwarded to the MAJCOM, the base engineers provide revisions and updates as necessary. During the construction phase, base level engineers participate in acceptance inspections. At the close of the construction phase the Base Civil Engineer assumes custody of the finished facility.

The MAJCOM is primarily responsible for programming and advocating the facility projects. In this role, the MAJCOM reviews and coordinates the programming documents prepared by the base level civil engineering personnel and prioritizes the weapon support facility projects with the balance of the non-system related MCP projects. After the programming documents are completed, the MAJCOM forwards them to HQ USAF as candidates for design. The MAJCOM also reviews DIs and 35% concept drawings and acts as an advocate for the facility projects at the HQ USAF F-Panel in August.

HQ USAF reviews the programming documents and issues the Design Instructions (DIs) along with transferring the construction funds to the AFRCE. After the MAJCOMs forward the programming documents, HQ USAF reviews and coordinates them through the Air Staff. HQ USAF is also responsible for conducting the F-Panel, completing required USC Title 10 article 2807 action, and answering congressional questions. In addition, HQ USAF transmits 35% and 100% DIs to the AFRCEs, reviews the 35% concept designs in August, and insures the facility projects are included in the POM. After Congress passes the Milcon Bill, HQ USAF transmits construction funds to the AFRCE.

The AFRCE is the Air Force's manager for design and construction. In this capacity the AFRCE receives design and construction funds from HQ USAF and transmits them to the design and construction agent (COE only in this research paper). The AFRCE then reviews and approves the preliminary design schedules prepared by the COE, performs functional reviews of the 35% concept designs and final designs, and conducts design review meetings with the COE. The AFRCE also acts as the liaison between the various Air Force offices in the MCP cycle and the COE and prepares Program Cost Estimates (PCEs) for submission to HQ USAF. In addition, the AFRCE monitors construction, and reports and resolves discrepancies between the contractor's work and the facility designs.

The U.S. Army Corps of Engineers (COE) is the design and construction agent. It is responsible for selecting contractors for design and construction. In addition, the COE performs as contracting officer in both cases and executes the design and construction contracts according to DOD and federal contract regulations and law. The COE is responsible for issuing all required changes to the contracts and resolving any contractor claims or disputes.

The AE and construction contractors are responsible for design and construction of the facilities. Each formally contracts through the COE to complete the design or construction work specified in the contract documents. As changes are incurred in the FDC, the AE or construction contractor (depending on the phase of facility acquisition) incorporates the actual changes into the work already in progress. These changes may result in increased cost and time for completion.

The final group in the third category includes OMB and Congress. OMB prepares the proposed Milcon Bill for Congressional consideration. In turn, Congress reviews, revises, and approves their version of the Milcon Bill. Afterwards, Congress appropriates funds for construction. OMB apportions these funds to the Air Force. Congress also reviews all projects where the design fee is estimated over $300,000 before HQ USAF issues a DI.

Research Question 4. What types of activities or events within the integrated systems and facilities acquisition process have the greatest impact upon the construction completion dates?

To gain an understanding of the way the facility construction completion dates would vary to changes within the integrated systems and facilities acquisition process, simulations were performed on the SLAM model. The first simulation involved variations in resource strengths of several of the key players identified in research question three. In a second simulation, initiation of the facility design phase was moved up to coincide with the beginning of the programming phase, and design responsibility transferred from the COE to the system contractor.

Varying resource strengths in the SLAM coding were relatively straightforward and required no additional diagramming. Changes in the design phase were more complicated, however, and a flow diagram which highlights these changes is provided in Appendix E.

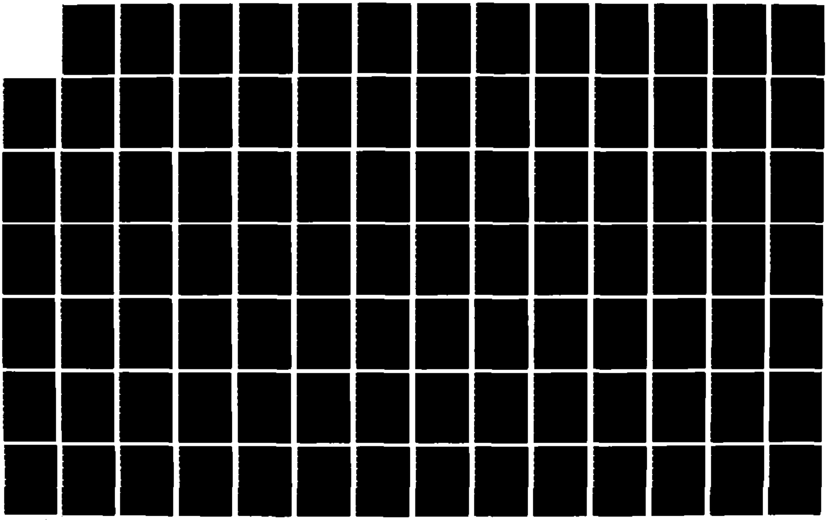
Given that the SLAM model is a faithful representation within the parameters and assumptions previously described, the outcomes of the simulations should reflect actual changes to the integrated systems and facilities acquisition process. The predictive power of the model will be abated, however, whenever deviations from the original SLAM model described by the conceptual model of Appendix B occur.

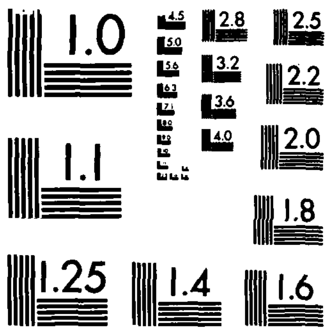
In the first simulation of the SLAM model the personnel resource levels of several of the key players were varied to determine what the impact would be on the time required for facility acquisition. These variations included increasing personnel strengths first in one office at a time, then in all offices at once. A personnel strength of 100 was chosen for the increase under the assumption that this number was sufficient to eliminate any process waiting time within an office. A subsequent variation was conducted to show the effects of decreasing the personnel resources. Resource levels were reduced in increments of two until a significant change was noted in the output. No resource was reduced to zero since this would cause complete stoppage of the simulation. First resources were reduced one at a time then all at one time.

The output of the SLAM simulation indicated that increasing resources one at a time had no significant effect on overall model output -- both in terms of numbers of projects and the time required for completion. Instead, a ripple effect was created around the resource increased which negated any overall savings. For instance, increasing AFRCE resources tended to overload and slow down the COE; increasing COE resources tended to overload and slow down the MAJCOM and AFRCE; and increasing MAJCOM resources had a similar effect on HQ USAF and the AFRCE. Increasing all

AD-A161 116 ANALYSIS AND MODELING OF THE FACILITY ACQUISITION PROCESS AS IT RELATES T (U) AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYST L J BLAKE 2/4

UNCLASSIFIED SEP 85 AFIT/GEM/LSY/85S-9 F/G 15/5 NL




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0

resources at once reduces the overall acquisition time by about 180 days.

Decreasing personnel resources, on the other hand, had no effect on model output until the decrease raised resource utilization levels to 100%. As the resources were decreased below this level, the overall process began to bog down significantly as reasonably expected (i.e. the resources cannot perform at greater than 100% capacity).

In the second simulation, the design and programming phases were initiated at the same time. This simulation assumed that a time savings would result from two sources. First, the design and programming would occur essentially in a parallel rather than series fashion. Secondly, the system contractor would be responsible for facility designs resulting in significant time savings by eliminating the COE AE selection process. However, the COE would still be responsible for design management through the program office and the Air Force engineering community would remain responsible for programming, environmental, etc.

The following narrative supports Appendix E, Simulation Two, which illustrates the changes made in the SLAM model to support the simulation. In Appendix E the three digit activity blocks shown correspond to blocks on the conceptual model of the integrated systems and facilities acquisition process in Appendix B. The S-blocks refer to simulation activities inserted into the SLAM coding.

In the simulation the system contractor hires an AE [S1] to perform design after entering Full Scale Development (FSD) [001]. After the MAJCOM prepares the programming documents [211], the SLAM checks that the AE is hired [S2] and design begins. In the simulation, design was initiated after the programming documents were completed by the MAJCOM, which would indicate that the basing and ILS concepts were confirmed. This follows the logic that even an AE hired by the system contractor would be unable to effectively begin the facility concept designs without firm basing, ILS concepts and the results from the site surveys.

After the AE receives the 1391 [S2], the design work begins. The AE completes the facility concept drawings based on 35% of 300 to 500 days [S3]. This time period was intentionally assigned well above that given a COE selected AE to do the same work since some added delay was anticipated because of the early start. After the concept designs are completed, the COE and AFRCE review sequence is performed and PCEs are submitted to HQ USAF [345-350].

On a course paralleling design, the project flows through the programming phase [212-219]. If the project is rejected by the F-Panel, it moves back to the MAJCOM for reaccomplishment [211]. However, once the F-Panel approves the project it goes through a bypass block [S5] which diverts it around Title 10, 2807 action [226] since design has already started. At this point, the simulation checks that the PCE has been submitted and the project approved by the F-Panel at block [S4], which is also the 35% milestone.

After reaching 35%, design continues to 95% [S3] while the project is being approved through OSD, OMB, and Congressional channels [356]. After reaching 95% the facility designs are reviewed and backchecked by the COE and AFRCE [361-363] and simulation reverts back to the original coding of the SLAM model for construction.

The revised model was run for the same simulation period as the standard integrated systems and facilities model. The resulting output (Appendix F) predicted that at least one year could be cut from even the ideal five year MCP cycle. It further demonstrated that under such a contracting arrangement weapons system facilities could be expected to be completed prior to IOC 96% of the time. However, a system such as this would have to be maintained under tight control of the program offices, HQ USAF and OSD to insure that only technical facilities directly related to successful IOC are included. Wholesale inclusion of other projects, even high visibility projects, would soon erase any potential for facility schedule compression. When large numbers of projects were permitted to enter the alternate design path described above, the COE and all levels of Air Force engineering rapidly became overloaded. The overloaded resources not only slowed the weapons system projects, but extended the time of completion for the other projects in the MCP system as well.

Based upon the simulation results and discussions with those individuals most closely involved with the acquisition processes (2,39,40,47), it became apparent that the time dependency of the MCP process conflicted almost directly with the events and goals of the weapons system acquisition process. When requirements are slow in development, meeting 35% design times became difficult. If the 35% cost estimate was late, a delay of one year could be expected unless special action was taken. Should the one year delay occur, the facility would almost certainly break its need date. This same scenario can be applied to each of the milestones on the MCP calendar. In each case delay seems to result due to late or inadequate requirements. However, when the early stages of facility acquisition are relieved of the MCP milestones, the impact of late requirements is not compounded by a separate acquisition cycle. Thus, a one month delay in requirements results in a one month delay in facility design.

# V. Conclusions and Recommendations

As the title suggests, this section is divided into two parts. In the first part, the conclusions drawn from the research are presented. The second part provides recommendations made by the researchers for possible changes in the acquisition process and for further research.

## Conclusions

This section presents the conclusions of this research project in three basic categories: the key motivators between the systems and facilities acquisition processes, the key players in the integrated process, and the results of simulations performed on the SLAM model of the integrated systems and facilities acquisition process. These conclusions are based primarily on the answers to the research questions presented in Chapter IV, Findings and Analysis. However, the entire research project was considered in their formulation.

The first set of conclusions is drawn from the four key motivators discussed in research questions one and two. In answering these research questions, four key events and activities in the systems acquisition process were identified which trigger responses and possible timing conflicts with the facilities acquisition process: entering FSD and the initiation of the FRP and FDC, the basing decision and deployment planning (including ILS planning), refinement and evolution of system design and mission capabilities, and the date and definition of IOC.

Analysis of these four motivators resulted in a conclusion that three principle causes of delay exist in the facilities acquisition process: late development and errors or changes in the facilities requirement plan and facilities design criteria, late development of the ILS and basing and deployment concepts, changes in the weapon system induced by technological evolution and expanded mission capability. These delays can occur in the programming, design and construction phases. However, from the simulation model the date most often missed was the 35% design milestone in the programming phase.

The research also concluded that the facilities acquisition process does not begin in earnest before the initiation of the FRP and FDC. Also, the product division civil engineers may approach the facilities requirements for new systems along the traditional civil engineering philosophy of not responding before the user or requestor generates specific needs. In addition, the facilities engineer may have little direct input into the research and development of the new system. Further, effort to begin programming before the FRP is completed may have limited results.

A final conclusion from the four key motivators concerns IOC. The research concludes that from 25% to 50% of the facility projects flowing through the MCP cycle would not be completed in time to support IOC without special management attention. This conclusion is also in harmony with other thesis research work on the same subject (24).

The second set of conclusions is derived from research question three. It concerns the key players and their roles and responsibilities. The research concluded that the key players in the integrated systems and facilities acquisition process are divided into three catagories: those making decisions concerning the operational deployment and employment scenario, those intrinsic to the program office (which would include the system contractor and the product division engineer), and those players directly associated with the MCP aspects of the facilities acquisition process.

These three groups must interact to develop the need dates and new/existing facility mixes required to support the system at each bed down location. From the analysis, however, a conclusion was drawn that the overall management of the facilities acquisition process is somewhat disjointed. For instance, the product division facility engineers may not be functionally assigned to the ILS division of the program office and are not responsible for the programming, design or construction of the facilities acquisition process. Also, the lines of communication may be excessively long between the key players (e.g. changes to the FDC must flow from the system contractor, to the program facilities engineer, to the AFRCE, to the COE, and then to the design AE).

The final set of conclusions is based on the results of simulations performed on the SLAM model discussed in research question four. From these simulations a conclusion is drawn that a uniform increase in personnel strength would shorten the MCP cycle by only about six months. Adding facility design to the system contractor's responsibilities would save an estimated twelve months in the facility acquisition schedule.

## Recommendations

The recommendations in this section are based on the conclusions developed from the project research. They are presented in the following three categories: increase the system contractor's responsibility in the integrated systems and facilities acquisition process, begin development of the Facility Requirements Plan and the Facility Design Criteria earlier and provide a facility engineering input to the research and development of the new system, and continue the research through modification and refinement of the SLAM model.

Recommendation 1. Increase the system contractor's responsibility in the integrated systems and facilities acquisition process -- particularly for technical facilities with a high degree of system interface.

One way of increasing the system contractor's responsibility would be to change the existing practice when preparing the civil engineering input to the PO's statement of work. For example, facility design tasking statements with the appropriate data by-products could be included in the contractural statement of work. With the weapons system prime contractor thusly responsible for sub-contracting the AE design work, many time consuming government contracting steps are by-passed. This procedure is recommended only for technical/operational facilities associated directly with successful achievement of the weapon system's IOC. In practice, this approach to facility design would mean that the PO would receive (as tasking by-products) the Preliminary Facilities Design Package (DI-S-3558) and the Final Design Package (DI-S-3559) from the prime contractor (15:I-40). The existing practice is to task the prime for only the Facility Requirement Plan (DI-S-3557) (15:I-40). Product division civil engineering organizations such as ASD/DE, should develop suitable model tasking statements for inclusion in weapon system contracts. The US Army Corps of Engineers (COE) involvement in facility design, although changed from the current practice, should continue. The COE should be tasked to provide technical support for the review of the Preliminary and Final Design Packages. The Air Force Civil Engineering Organization is not currently manned to perform this review function unaided and there is no apparent need for them to do so.

This approach has been employed successfully by ASD/DES in conjunction with facility designs for an instrument flight simulator facility for deployment of a new training aircraft (43). In this instance the PO initially funded the facility design and was later reimbursed with MCP design funds. A general application of this recommendation would also require a change in public law to allow facility design to proceed with Research and Development rather than design funds.

Recommendation 2. Begin development of the Facility Requirements Plan (FRP) and the Facility Design Criteria (FDC) earlier and provide a facility engineering input to the research and development effort for new weapons systems.

In this recommendation the product division facility engineer breaks away from the traditional civil engineering philosophy of waiting for the customer to identify a requirement. Instead, the facility engineer becomes pro-active in preparation of the FRP and FDC through greater use of computer information systems and increased advocacy of existing facility and infrastructure constraints during research and development of the new system.

To begin earlier development of the FRP and FDC, the product division facility engineers should develop management and decision support systems with suitable data bases to allow prediction of facility requirements. A typical system would include a data base of information concerning the parameters and facility to system interfaces of previous weapon systems. The FRP and FDC for a new system would then be derived as an evolution of the existing data (28).

The facility engineer should advocate development of new systems to fit within the general constraints of the existing infrastructure. In this recommendation the facility engineer actively participates during the early phases of system acquisition to insure that system development and evolution incorporates known facility and civil engineering repair force limitations (e.g. new computer systems should be designed to operate from the typical quality of electrical power available on the utility power grids, new aircraft should be developed around the pavement loading restrictions imposed by their operational locations).

Recommendation 3. Continue the research through modification and refinement of the SLAM simulation model.

Additional research should be conducted in the area of facilities acquisition through simulations with the SLAM model. This research should involve modification and refinement of the current SLAM model to reflect greater detail in the acquisition process. Also, more activity start/stop data should be collected to further verify and validate the model. Where possible, model simulations should be performed where actual changes to the facility acquisition process have been made. The model's predictive capability could then be tested and validated against a known change in processing time.

## Appendix A: <u>Summary Diagram of the Integrated Facilities/Systems Acquisition Process</u>

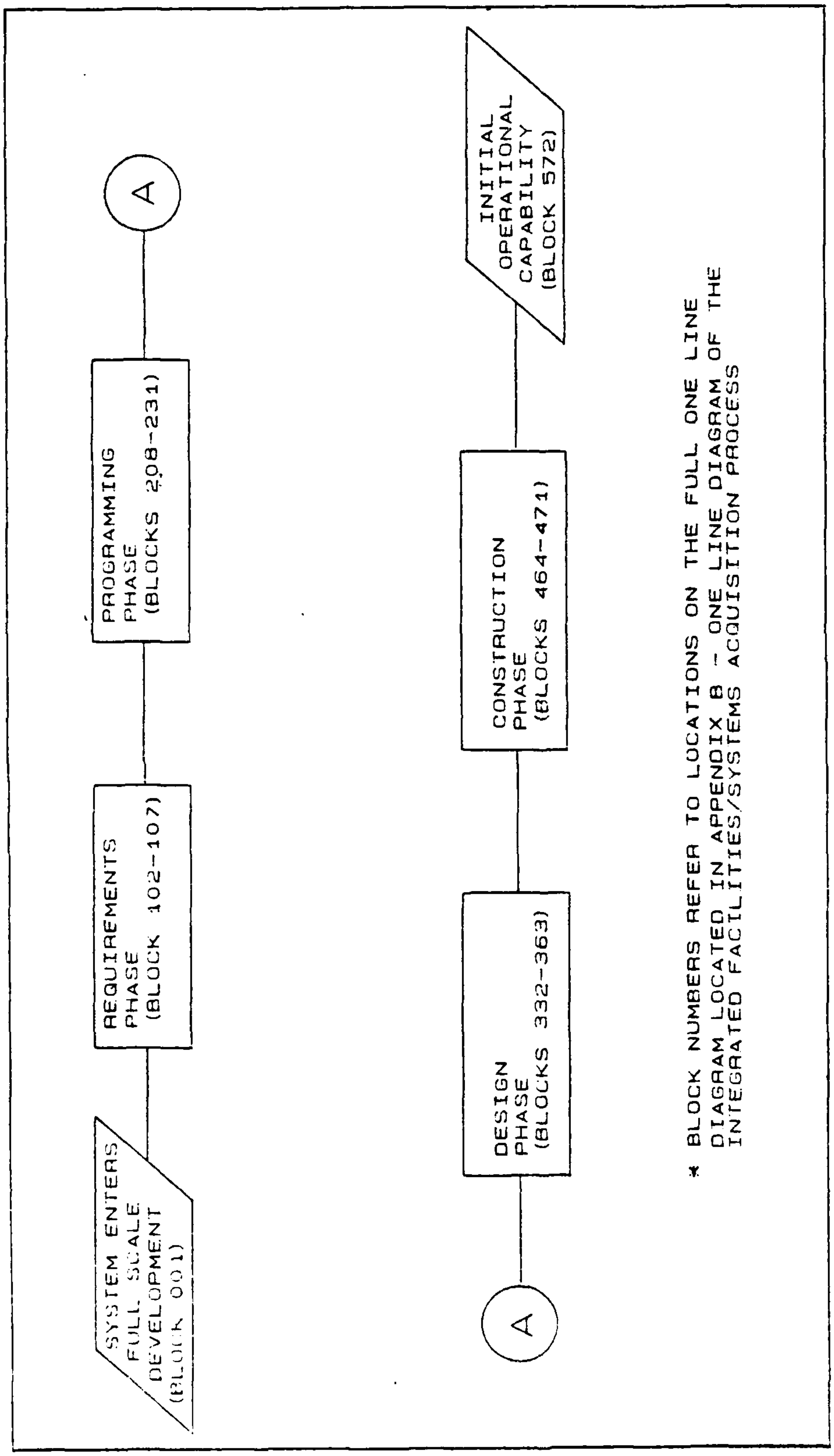



Figure 3. Summary Diagram of the Integrated Facilities/Systems Acquisition Process

## Appendix B: Conceptual Diagram of the Integrated Facilities/Systems Acquisition Process

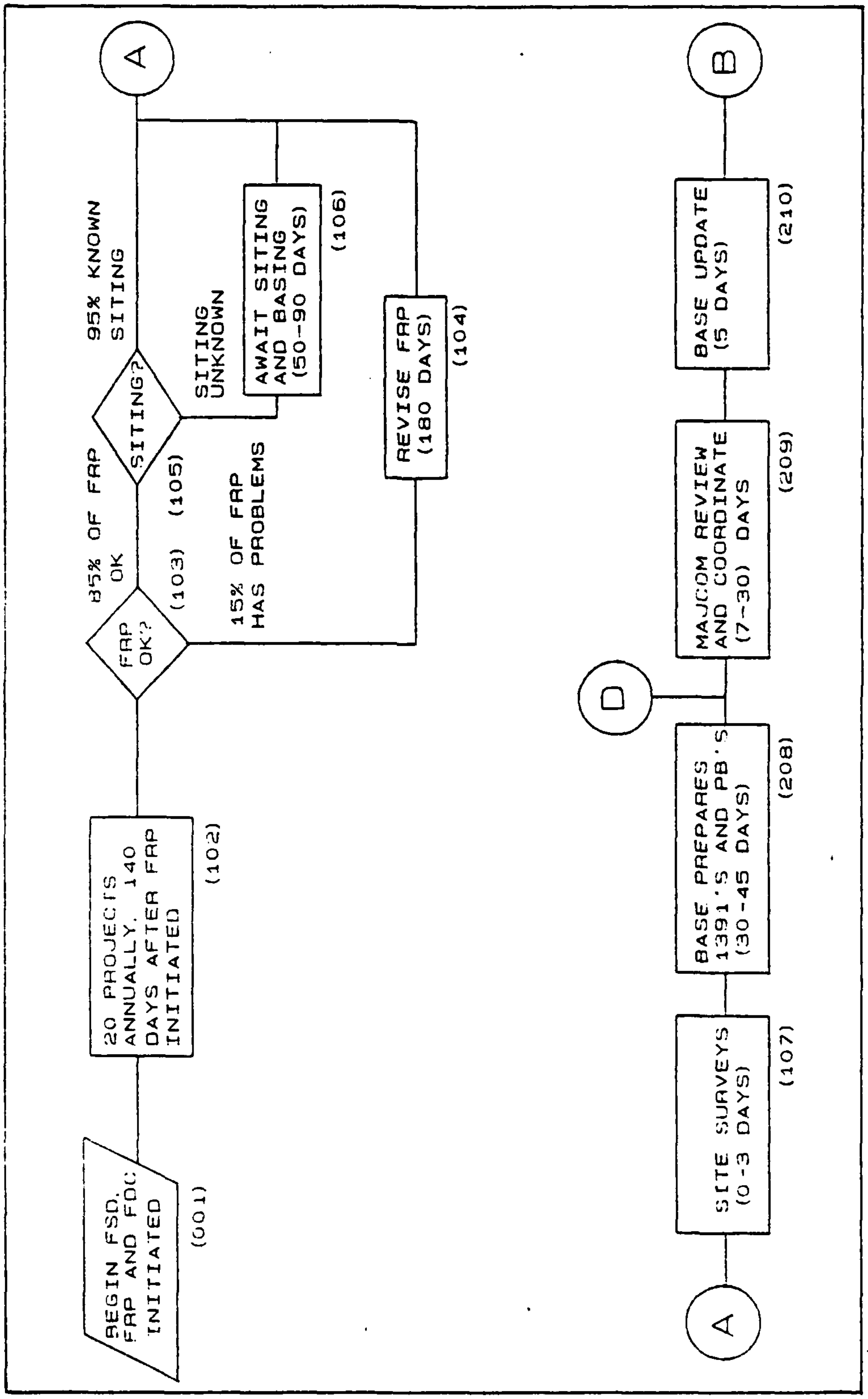



Figure 4. Conceptual Diagram of the Integrated Facilities/Systems Acquisition Process

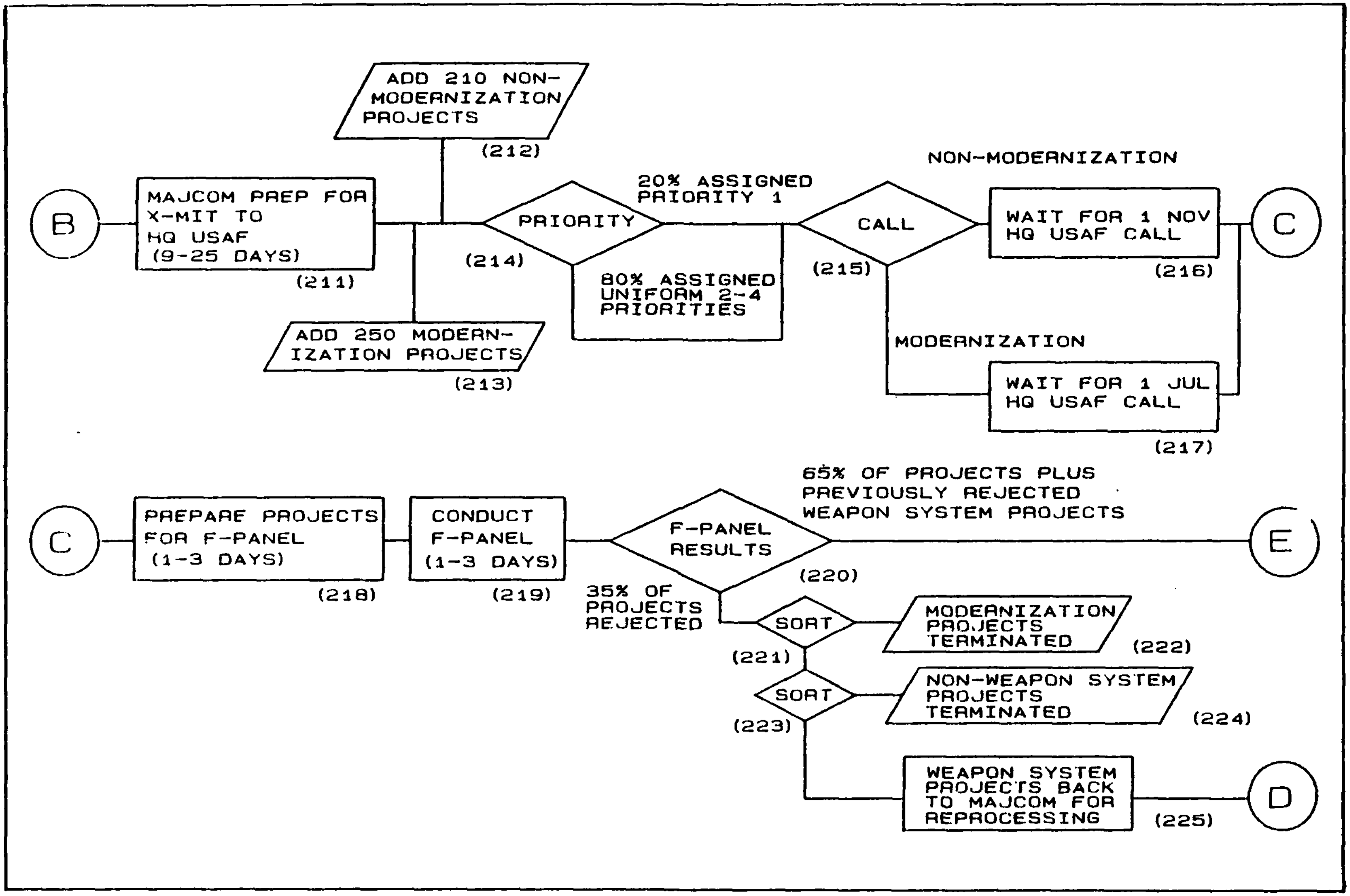



**Figure 5. Conceptual Diagram of the Integrated Facilities/Systems Acquisition Process**

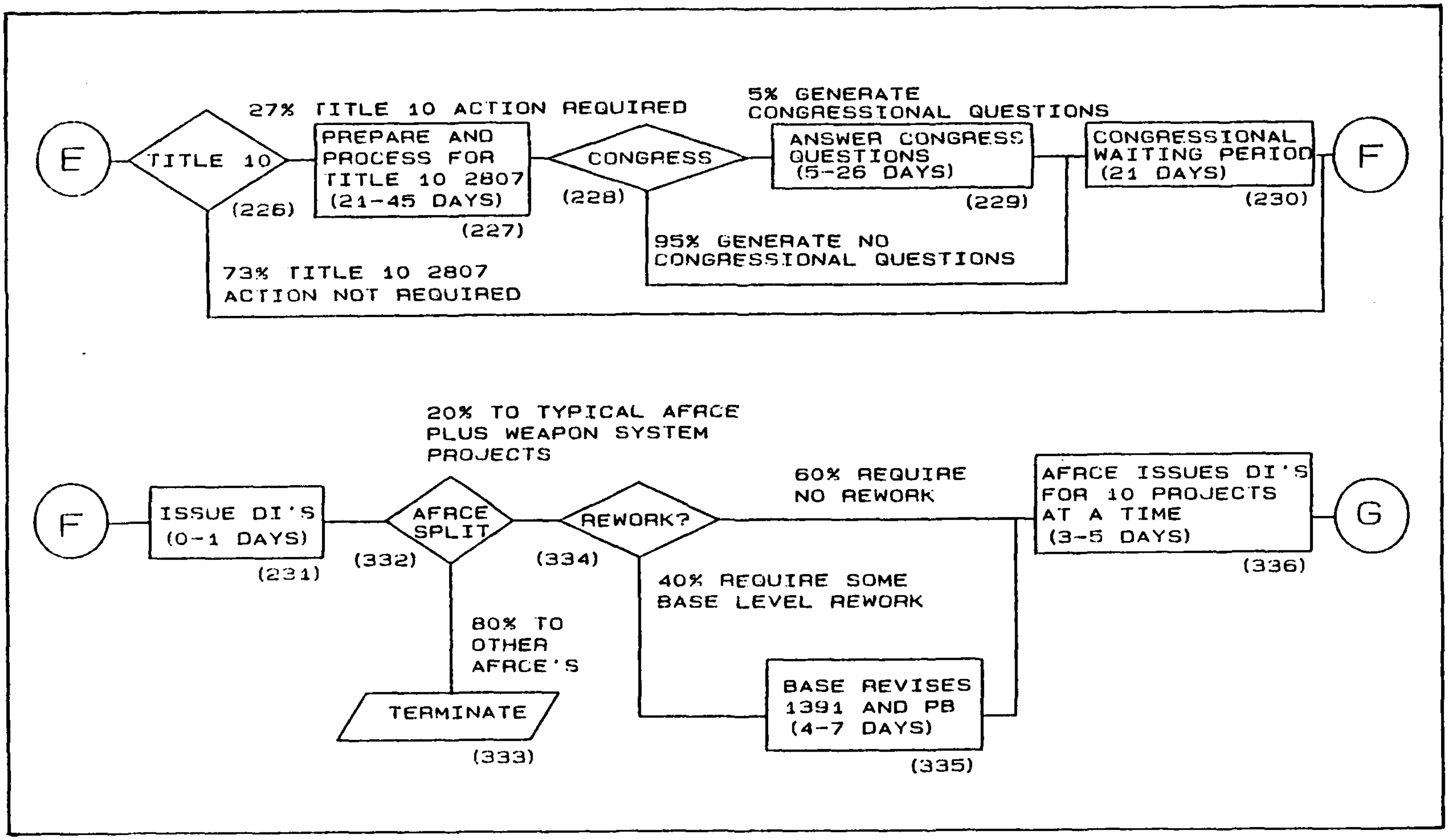



Figure 6. Conceptual Diagram of the Integrated Facilities/Systems Acquisition Process

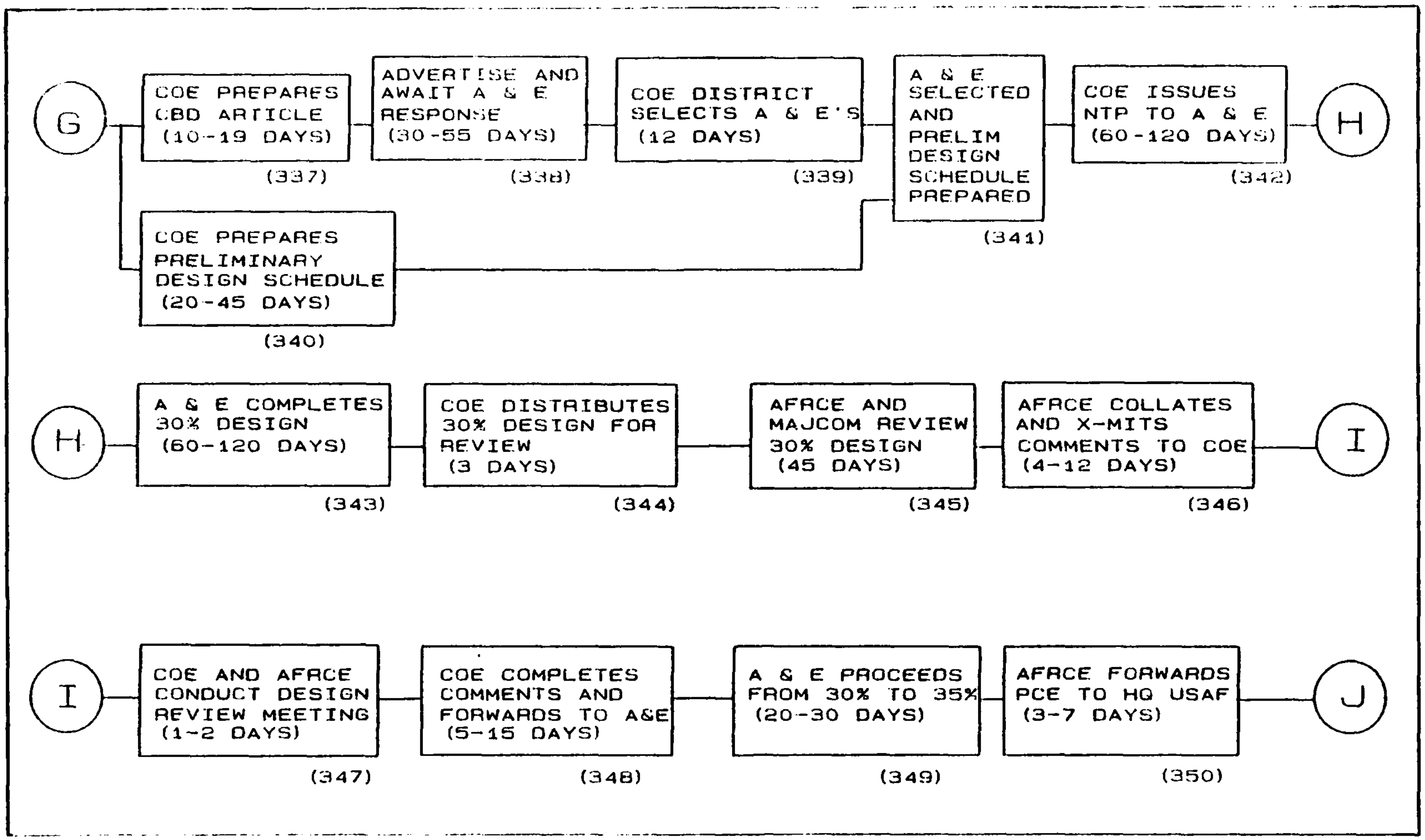



Figure 7. Conceptual Diagram of the Integrated Facilities/Systems Acquisition Process

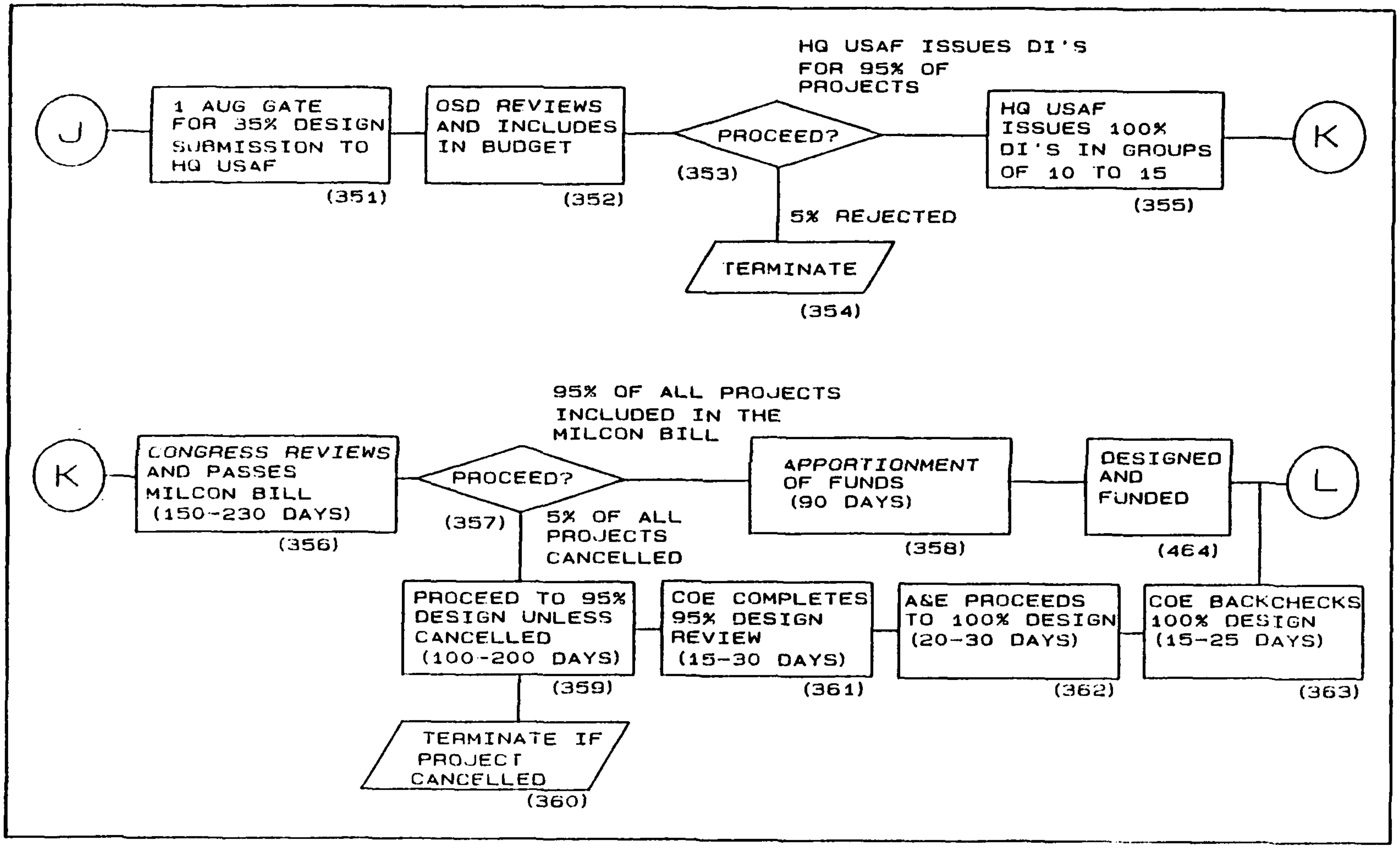



Figure 8. Conceptual Diagram of the Integrated Facilities/Systems Acquisition Process

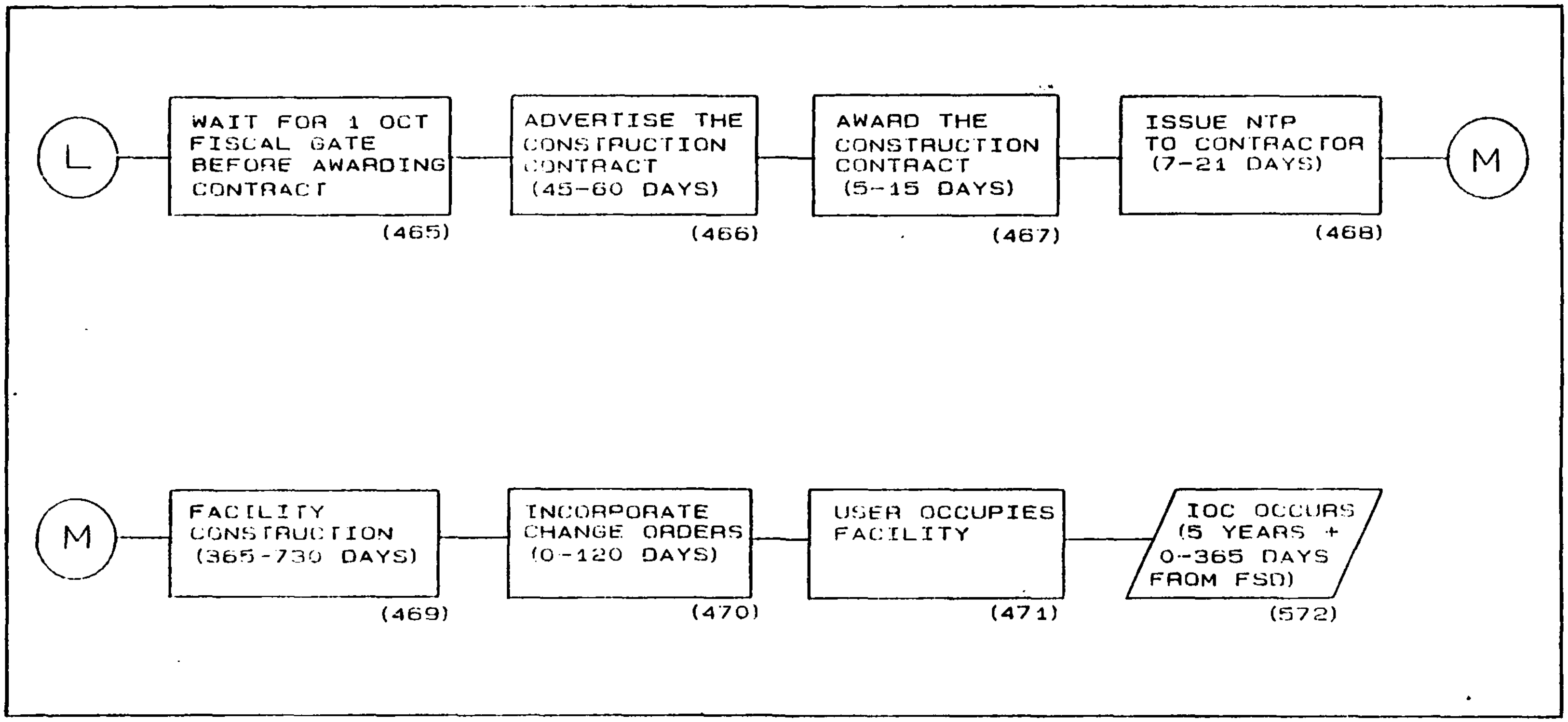



Figure 9. Conceptual Diagram of the Integrated Facilities/Systems Acquisition Process

# Appendix C: Verification and Validation Model

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*                                                                   *
*      INTEGRATED SYSTEMS AND FACILITIES ACQUISITION MODEL          *
*                                                                   *
*              VERIFICATION AND VALIDATION VERSION                  *
*                                                                   *
*                              USING                                *
*                                                                   *
*                                                                   *
*                    * * * * * * * * * * * * * *                    *
*                    *                         *                    *
*                    *   SLAM II VERSION 2.1   *                    *
*                    *                         *                    *
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*                                                                   *
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ECHO OF INPUT PROGRAM

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GEN,BLAKE & MARCHBANKS,MCP FACILITY MODEL,8/16/85,1,Y,N,Y,N,Y,1,72;
LIMITS,54,10,2000;
INTLC,XX(1)=0,XX(2)=0,XX(3)=0,XX(4)=0,XX(5)=0,XX(6)=0,XX(7)=0;
INTLC,XX(8)=0,XX(9)=0,XX(10)=0,XX(13)=0,XX(14)=0,XX(15)=0,XX(88)=0;
PRIORITY/1,LVF(9),/2,LVF(9)/3,LVF(9)/4,LVF(9)/5,LVF(9)/8,LVF(9);
PRIORITY/9,LVF(9)/10,LVF(9)/14,LVF(9)/17,LVF(9)/18,LVF(9);
PRIORITY/21,LVF(9)/22,FIFO/24,LVF(9)/28,LVF(9)/30,LVF(9)/31,HVF(7);
PRIORITY/32,HVF(7)/33,HVF(7)/34,LVF(9)/35,LVF(9)/37,LVF(9);
PRIORITY/38,LVF(9)/41,LVF(9)/42,LVF(9)/45,LVF(9)/46,LVF(9);
PRIORITY/47,LVF(9)/48,LVF(9)/49,LVF(9)/50,LVF(9)/51,LVF(9);
PRIORITY/52,LVF(9);
;
;    EXPLANATION OF FILE PRIORITIES:
;
;        PRIORITIZED FILES, LVF(9) = LOWEST VALUE FIRST BASED ON VALUE
; RECORDED IN FILE NO. 9.  FILE 9 IS THE ASSIGNED PROJECT PRIORITY.
; HVF(7) = HIGHEST VALUE FIRST BASED ON VALUE IN FILE NUMBER 7.  FILE
; 7 RECORDS THE NUMBER OF RESOURCE UNITS REQUIRED FOR AN ACTIVITY.
; THUS IT WILL PROCESS THOSE REQUIRING THE MOST RESOURCES FIRST.
; FIFO = FIRST IN FIRST OUT.  ALL FILES NOT OTHERWISE SPECIFIED USE
; FIFO PROCESSING.
;
;
;             ****************************************
;             *                                      *
;             *  INTEGRATED SYSTEMS AND FACILITIES   *
;             *         ACQUISITION MODEL            *
;             *                                      *
;             *         TIME UNIT IS ONE DAY         *
;             *       DAY 1, 366, ECT. =  1 JAN      *
;             *                                      *
;             *         REV V: - 27 JULY 85          *
;             *       VERIFICATION/VALIDATION        *
;             ****************************************
;
;
;
;        RESOURCE STATEMENTS REPRESENT INDIVIDUALS ASSIGNED TO THE
; VARIOUS ORGANIZATIONS INVOLVED IN THE ACQUISITION OF AIR FORCE
; FACILITIES UNDER THE MILITARY CONSTRUCTION PROGRAM.
;        THE NUMBER IN PARENTHESIS REPRESENTS THE NUMBER OF PEOPLE
; ASSIGNED TO THE FUNCTIONAL AREA REPRESENTED.  THE OTHER NUMBERS
; REPRESENT THE FILES IN WHICH PROJECTS ARE AWAITING ACTION BY THE
; ORGANIZATION WHERE THE RESOURCE IS EMPLOYED.  THE RESOURCE WILL
; CONSIDER THE ORDER OF THE FILE LIST WHEN SELECTING A PROJECT TO
; SERVICE NEXT.
;
;
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;
NETWORK;
     RESOURCE/LEECD(5),17,7,43,15,36,13,11,18;  AIR STAFF, PROGRAMS.
     RESOURCE/LEECC(6),40,39,47,51;         AIR STAFF,CONSTRUCTION.
     RESOURCE/REQ(6),4,22,1;                BASE PROGRAMMERS & ENGRS.
     RESOURCE/BDEE(7),33,9;                 BASE ENGINEERING.
     RESOURCE/BASE(1),2;                    MAJCOM MISSION PLANNERS.
     RESOURCE/MDEE(4),32;                   MAJCOM,ENGINEERING.
     RESOURCE/MPROG(5),5,20,52,3;           MAJCOM PROGRAMMERS.
     RESOURCE/AFRCE(9),19,35,31,23,12,46,50; AFRCE PROJECT MANAGERS.
     RESOURCE/COE(18),26,27,29,34,41,25,48,49,45;  CORPS OF ENGNR.
;                                                 PROJECT MANAGERS.
;
;      GATES ARE USED TO CONTROL THE FLOW OF PROJS. THROUGH THE MCP
; PROCESS.  PROJECTS ARE STOPPED AT CLOSED GATES AND ACCUMULATE IN
; THE FILE ASSIGNED TO THE GATE.  WHEN THE GATE IS OPEN THE PROJECTS
; ARE ALLOWED TO PASS.  EITHER ALL OF THE PROJECTS IN THE FILE OR A
; SPECIFIED NUMBER OF THEM MAY PASS BEFORE THE GATE CLOSES.  GATE
; OPERATION IS CONTROLLED BY THE MODEL SEGMENTS LISTED PRIOR TO THE
; MAIN PROGRAM.  GATE OPENING IS DEPENDENT EITHER ON THE PASSAGE OF
; TIME OR THE ACCUMULATION OF A DEFINED NUMBER OF PROJECTS.
;
GATE/CALL,CLOSED,8;                         PROJECT CALL FOR ALL
                                            MODERNIZATION PROJECTS.
GATE/CALLN,CLOSED,10;                       PROJECT CALL FOR ALL
;                                           NON-MODERNIZATION PROJS.
;                                           -1 NOV XX.
GATE/NEWFY,CLOSED,42;                       NEW FY, 1 OCT XX.
GATE/NEED,CLOSED,44;                        IDENTIFY REQ.
GATE/OTHER,CLOSED,6;                        PROJ. FROM OTHER MAJCOMS
GATE/CONG28,CLOSED,16;                      HOLD FOR TITLE 10.
GATE/FRC,CLOSED,14;                         GROUP PROJS. BY 5.
GATE/DI,CLOSED,24;                          WAITING FOR DI.
GATE/DISTR,CLOSED,21;                       WAITING AT AFRCE.
GATE/CORPS,CLOSED,28;                       WAITING FOR CORPS PM.
GATE/REV30,CLOSED,30;                       30% PROJ REVIEW.
GATE/CALL2,CLOSED,37;                       PROJS TO CONG. ABOUT
;                                           1 JANUARY EACH YEAR.
GATE/DI100,CLOSED,38;                       100% DESIGN INSTRUC-
;                                           TION TO MAJCOM AND
;                                           AFRCE.
GATE/HOLD,OPEN,53;
GATE/HOLD1,OPEN,54;
;
;
;    MODEL SEGMENT A      ** RELEASE PROJECTS FOR PROGRAMMING **
;
;
;
;
     CREATE,,40,,1;
A1   GOON;
```

```
        ASSIGN,ATRIB(1) = TNOW;
A1A     OPEN,NEED,1;                              FACILITY REQUIREMENTS
        ASSIGN,XX(88) = TNOW + UNFRM(70,99);      PLAN (FRP) PRODUCED
        GOON,1;                                   EVERY 365 DAYS. EACH
        ACT,,XX(4).GE.20,A2;                      PLAN IDENTIFIES NEED
        ACT,1,,A1A;                               FOR 20 NON-MODERNIZA-
;                                                 TION PROJECTS.
;
A2      CLOSE,NEED;
        ASSIGN,XX(4) = 0;                         PROJECT COUNTER.
        ASSIGN,ATRIB(1) = ATRIB(1) + 365 - TNOW;
        ACT,ATRIB(1),,A1;                         RECYCLE EVERY 365
;                                                 DAYS, BACK TO A1.
;
;
        CREATE,365,45;
        ACT;
A3      ASSIGN,ATRIB(1) = TNOW;
A4      GOON;
A4A     OPEN,OTHER,1;                             RELEASE 250 PROJECTS
        ACT,,XX(6).GE.250,A5;                     FROM OTHER MAJCOMS
        ACT,1,,A4;                                EACH YEAR.
A5      CLOSE,OTHER;
        ASSIGN,XX(6) = 0;
A6      GOON,1;
        ACT,,TNOW - ATRIB(1).GE.165,A7;           CALL OCCURS IN AUG.
        ACT/90,2,,A6;                             FOR PROJECTS WITH
A7      OPEN,CALL2;                               35% DESIGN COMPLETE
;                                                 FOR SUBMISSION TO
;                                                 CONGRESS (1 JAN).
        AWAIT(36),LEECD/2;                        WAIT FOR 2 STAFFERS
        ACT,90;                                   ACCEPT PROJECTS FOR
A8      CLOSE,CALL2;                              NEXT 60 DAYS.
        FREE,LEECD/2;
        GOON;
        TERMINATE;
;
;
;
;
;          MODEL SEGMENT B          ** AIR STAFF PROJECT CALL **
;
;
;
;
        CREATE,,180,,1;                           INITIALIZE AT DAY
B0      GOON,2;                                   180 EACH YEAR - ABOUT
        ACT,,,B8;                                 JULY FIRST.
        ACT;
B1      OPEN,CALL;                                USAF CALL FOR PROJS
        ASSIGN,ATRIB(1) = TNOW;                   (MODERNIZATION ONLY).
B2      AWAIT(7),LEECD/1;
```

```
        ACT,30;                                  MAJCOM SUBMISSION.
   B3   CLOSE,CALL;                              SUBMISSION PER. OVER.
        ASSIGN,ATRIB(1) = TNOW - ATRIB(1);       CALCULATE LAPSED TIME.
        GOON,2;
        ACT,,,B6;
        ACT;
   B4   GOON,1;
        ACT,,NNACT(10).EQ.0,B5;
        ACT,1,,B4;
   B5   FREE,LEECD/1;                              RELEASE LEECD
        TERMINATE;                                 STAFFER.
   B6   GOON,1;
        ACT,90-ATRIB(1);                           1 OCT XX --
        OPEN,NEWFY;                                BEGIN NEW FY.
        ACT/91,30;                                 1 NOV XX; USAF CALL
        OPEN,CALLN;                                FOR NON-MODERNIZA-
        GOON;                                      TION PROJECTS.
        AWAIT(43),LEECD/1;                         LEECD STAFF PROJECTS.
        ACT,60;
        CLOSE,NEWFY;
        CLOSE,CALLN;
   B7   GOON,1;
        ACT,,NNACT(10).EQ.0,B5;
        ACT,1,,B7;
   B8   GOON,1;
        ACT,365,,B0;                               RECYCLE EVERY 365
 ;                                                 DAYS TO B0.
 ;
 ;
 ;
 ;        MODEL SEGMENT C        ** STAFF TITLE 10, 2807 ACTION **
 ;
 ;
 ;
 ;
        CREATE,,,,1;
   C2   GOON,1;                                    CHECK EVERY 30 DAYS
        ACT,,NNQ(16).GE.5,C3;                      FOR FIVE OR MORE
        ACT,30,,C2;                                PROJECTS REQUIRING
   C3   GOON,1;                                    CONGRESSIONAL ACTION.
        ACT,,NNQ(15).GT.0,C2;
        ACT,,NNQ(15).LE.0;
        AWAIT(15),LEECD/2;                         STAFF AT LEAST 5
        ASSIGN,XX(1) = UNFRM(21,45);               PROJECTS AT A TIME.
 ;                                                 XX(1)= PROCESSING
        OPEN,CONG28;                               TIME.
        ACT/92,2;
   C4   GOON,1;                                    PROCESS UNTIL ALL
        ACT,,NNQ(16).EQ.0,C5;                      PROJECTS WAITING FOR
        ACT,1,,C4;                                 CONGRESSIONAL ACTION
   C5   CLOSE,CONG28,1;                            HAVE BEEN WORKED.
        ACT,,NNACT(20).EQ.0,C6;
```

```
        ACT,1,,C5;
C6      FREE,LEECD/2;                                        RELEASE LEECD WHEN
        ACT,,,C2;                                            PROCESSING COMPLETE.
;
;
;
;
;          MODEL SEGMENT D          ** FACILITY PANEL ACTION **
;
;
;
;
        CREATE,,,,1;
D1      GOON,1;
        ACT,,NNQ(14).GT.0.AND.NNQ(14).EQ.XX(2),D3;
        ACT,,NNQ(14).GT.0.AND.NNQ(14).EQ.XX(15),D6;
        ACT,1,,D1;
D3      AWAIT(11)/LEECD/1;
        CLOSE,HOLD;                                          TEMPORARY DELAY WHILE
        CLOSE,HOLD1;                                         PROJS ENTER FACILITY
D4      OPEN,FRC;                                            PANEL (F PANEL).
        ACT,2;                                               F PANEL CONVENES.
        GOON,1;
        ACT,,NNQ(14).EQ.0,D5;
        ACT,2,,D4;
D5      CLOSE,FRC;
        OPEN,HOLD;                                           END TEMPORARY DELAY.
        OPEN,HOLD1;                                   NOTE:  GATES HOLD & HOLD1
        ASSIGN,XX(2)=0;                                      USED IN FIRST 2 OR 3
        ACT,,,D7A;                                           YRS. OF MODEL RUN.
D6      AWAIT(13),LEECD/1;                                   THEY CONTINUE TO
        CLOSE,HOLD;                                          OPERATE THROUGHOUT
        CLOSE,HOLD1;                                         THE SIMULATION RUN,
D6A     OPEN,FRC;                                            BUT NO DELAY RESULTS.
        ACT,2;                                               THEY ACT TO ARTI-
        GOON,1;                                              FICIALLY CLOSE GATE
        ACT,,NNQ(14).EQ.0,D7;                                'OTHER' SHOULD IT BE
        ACT,1,,D6A;                                          OPEN WHEN GATE FRC
D7      CLOSE,FRC;                                           OPENS.
        OPEN,HOLD;
        OPEN,HOLD1;
        ASSIGN,XX(15) = 0;
D7A     GOON,2;
        ACT,,,D1;
        ACT/93,5;
D8      GOON,1;
        ACT,,NNACT(21).EQ.0,D9;
        ACT,1,,D8;
D9      FREE,LEECD/1;                                        RELEASE LEECD WHEN
        TERMINATE;                                           PROJECTS RELEASED
        GOON;                                                COMPLETE ACTIVITY 21.
;
```

```
;
;
;
;
;          MODEL SEGMENT E     **DISTRIBUTE DESIGN INSTRUCTIONS**
;
;
;
;
        CREATE,30,30,3,,1;
E0      GOON,1;
        ASSIGN,ATRIB(5) = TNOW - ATRIB(3);
        GOON,1;
        ACT,,ATRIB(5).GE.16,E5A;
        ACT,1;
        GOON,1;
        ACT,,NNQ(21).GT.0.AND.NNQ(21).LE.10,E2;
        ACT,,NNQ(21).EQ.0,E0;
        ACT,,NNQ(21).GT.10,E1;
        ACT,,,E5A;
E1      ASSIGN,ATRIB(4) = 2;
        ACT,,,E3;
E2      ASSIGN,ATRIB(4) = 1;
E3      AWAIT(19/1),AFRCE/ATRIB(4),BALK(E5A);
        AWAIT(20/1),MPROG/ATRIB(4),BALK(E5;
        ACT/94;
        OPEN,DISTR,1;                              USAF DISTRIBUTES
        ACT,,TNOW.GE.ATRIB(3) + 5,E4;              DI'S.
        ACT,5;
E4      CLOSE, DISTR;
        ACT,UNFRM(5,15);                           PROCESS DI.
        FREE,MPROG/ATRIB(4);
E5      FREE,AFRCE/ATRIB(4);                       FREE AFRCE AND MAJCOM
E5A     TERMINATE;                                 AFTER RECEIPT OF DI.
;
;        MODEL SEGMENT E1    ** 35% DESIGN BEING PROCESSED AT USAF **
;
;
        CREATE,,250,,1,1;
        ACT;
E6      ASSIGN,ATRIB(1) = TNOW;
E7      GOON,1;
        ACT,,NNQ(38).GT.0,E8;
        ACT,5,,E7;
E8      AWAIT(39),LEECC/1;                         WAIT FOR LEECC
        ASSIGN,ATRIB(3) = 1;                       STAFFER.
        ACT/95;
E9      OPEN,DI100;                                ISSUE APPROVAL TO
        GOON,1;                                    PROCEED WITH DESIGN
        ACT,,XX(3).GT.0.AND.XX(3).LE.5,E13;        TO 100%.
        ACT,,XX(3).GT.5.AND.XX(3).LE.10,E10;
        ACT,,XX(3).GT.10,E11;
```

```
        ACT,5,,E9;
E10     ASSIGN,ATRIB(3) = 2;                     INCREASE REQUIREMENT
        ACT,,,E12;                               FOR LEECC STAFF BY 1.
E11     ASSIGN,ATRIB(3) = 3;                     INCREASE REQUIREMENT
        ACT,,,E12;                               BY 2. (BASED ON # OF
E12     ASSIGN,ATRIB(4) = ATRIB(3) - 1;          PROJECTS - XX(3).)
        AWAIT(40),LEECC/ATRIB(4);
E13     GOON;
        ACT,2;
        CLOSE,DI100;                             RELEASE COMPLETED.
        ASSIGN,XX(3) = 0;
        GOON,2;
        ACT,,,E16;
        ACT,UNFRM(30,50);
E14     GOON,1;
        ACT,,NNACT(41).EQ.0,E15;
        ACT,,NNACT(41).NE.0;
        ACT,1,,E14;
E15     FREE,LEECC/ATRIB(3);                     RELEASE LEECC STAFF.
        TERMINATE;
E16     GOON,1;
        ACT,,NNQ(38).GT.0,E8;                    WAIT FOR MORE PROJS.
        ACT,1,,E16;
;
;
;
;
;
;
;
;          MODEL SEGMENT F      ** ISSUE DESIGN INSTRUCTION TO CORPS **
;
;
;
;
;
;
;
        CREATE,,,,1;
F1      GOON,1;
        ACT,,NNQ(24).GE.10,F2;                   CHECK FOR 10 OR MORE
;                                                IN FILE 24.
        ACT,,NNQ(24).GT.0.AND.NNQ(24).LT.10.AND.NNACT(25).EQ.0,F3;
        ACT,,,F7;
F2      ASSIGN,ATRIB(3) = 2;                     ASSIGN 2 AFRCE PROJ
        ACT,,,F4;                                MANAGERS (PM).
F3      ASSIGN,ATRIB(3) = 1;                     ASSIGN 1 AFRCE PM.
F4      GOON;
        AWAIT(23),AFRCE/ATRIB(3);
F5      OPEN,DI,1;                               AFRCE FORWARDS DESIGN
        ACT,,NNQ(24).EQ.0,F6;                    INSTRUCTION TO COE.
        ACT,1,,F5;
```

```
F6    GOON,1
      ACT/97,5;
      CLOSE,DI;
      ACT,UNFRM(4,8);                                   PROCESS FOR COE ISSUE
      FREE,AFRCE/ATRIB(3);
F7    GOON,1;
      ACT,1,,F1;
;
;
;
;
;      MODEL  SEGMENT G      ** ARCHITECT-ENGINEER (AE) SELECTION **
;
;
;
;
      CREATE,,,,1;
G1    GOON;
      ACT;
      ASSIGN,ATRIB(3) = 0;                              RESET COUNTER
      GOON,1;                                           TAKE ONLY 1 OF THE
      ACT,,NNQ(28).EQ.0,G7;                             FOLLOWING ACTIVITIES.
      ACT,,NNQ(28).LT.5.AND.NNQ(24).EQ.0.AND.NNACT(26).EQ.0,G2;
      ACT,,NNQ(28).EQ.5,G2;
      ACT,,NNQ(28).GT.5,G5;
      ACT,,,G7;
G2    AWAIT(25),COE/1;                                  WAIT FOR COE PM.
      ASSIGN,ATRIB(3) = 1;                              ASSIGN 1 COE PM
      ASSIGN,XX(8) = UNFRM(20,35);                      ASSIGN TIMES FOR :
      ASSIGN,XX(9) = UNFRM(3,8);                        XX(8)= PREPARE DESIGN
                                                               SCHEDULE.
      ASSIGN,XX(10) = EXPON(10,3);                      XX(9)= PREPARE CBD
                                                               ANNOUNCEMENT.
G3    OPEN,CORPS,1;                                     XX(10) = AE SELECTION.
      ACT/98,4;
      GOON,1;
      ACT,,XX(7).LE.5.AND.XX(7).GT.0,G6;                ASSIGN GROUPS OF 5.
      ACT,,XX(7).GT.5,G4;
      ACT,1,,G3;
G4    AWAIT(26),COE/1;                                  ASSIGN MORE COE PM'S
      ASSIGN,ATRIB(3) = 2;                              (2 ASSIGNED).
      ACT,,,G6;
G5    AWAIT(27),COE/2;                                   DI ISSUED TO COE.
      GOON;
      ASSIGN,XX(8) = UNFRM(20,55);
      ASSIGN,XX(9) = UNFRM(10,20);
      ASSIGN,XX(10) = EXPON(12,3);
      GOON;
      OPEN,CORPS,1;
      ACT/98,4;
      ASSIGN,ATRIB(3) = 2;                              ASSIGN TWO COE PMS.
G6    CLOSE,CORPS;
```

```
        ASSIGN,XX(7) = 0;                                   RESET COUNTER.
        GOON,2;                                             START DUAL PATH.
        ACT,1,,G1;
        ACT;
        AWAIT(12),AFRCE/1;
        ACT,XX(10);                                         AE SELECTION BOARD.
        FREE,AFRCE/1;                                       RELEASE AFRCE.
        GOON;
        ACT,UNFRM(5,21);                                    NEGOTIATE WITH AE.
        GOON;
        ACT,9;
        GOON;
        ACT,UNFRM(5,20);                                    PREPARE,SUBMIT AND
        FREE,COE/ATRIB(3);                                  REVIEW AUDIT OF AE
        TERMINATE;
G7      GOON;
        ACT,1,,G1;
        TERMINATE;
        GOON;
;
;
;
        CREATE,,,,1;
G8      GOON,1;                                             ACCOMPLISH 30%
;                                                           DESIGN REVIEW.
        ACT,,NNQ(30).GT.0.AND.NNQ(30).LT.5.AND.NNACT(31).EQ.0,G9;
        ACT,,NNQ(30).EQ.5,G9;
        ACT,,NNQ(30).GT.5.AND.NNQ(30).LE.15,G10;
        ACT,,NNQ(30).GT.15,G11;
        ACT,1,,G8
G9      ASSIGN,ATRIB(7) = 1;                                ASSIGNING NUMBER OF
        ACT,,,G12;                                          RESOURCES REQUIRED
G10     ASSIGN,ATRIB(7) = 2;                                BASED ON NUMBER OF
        ACT,,,G12;                                          PROJECTS WAITING.
G11     ASSIGN,ATRIB(7) = 4;
G12     GOON,1;
        ACT,,NNQ(29).EQ.0,G12A;                             SELECT ONE OF THE
        ACT,,NNQ(29).NE.0;                                  FOLLOWING ACTIVITIES.
        GOON,1;
        ACT,1,,G8;
G12A    AWAIT(29),COE/ATRIB(7);
        ASSIGN,XX(21) = EXPON(3);                           TIME FOR COE TO
                                                            DISTRIBUTE TO ALL
        ASSIGN,XX(22) = TNOW;                               REVIEWERS.
        OPEN,REV30;
        ACT/99,1;
        CLOSE,REV30;
        GOON,2;                                             TAKE BOTH OF THE
        ACT,5,,G8;                                          NEXT ACTIVITIES.
        ACT;
        AWAIT(31),AFRCE/ATRIB(7);
        AWAIT(32),MDEE/ATRIB(7);
```

```
        AWAIT(33),BDEE/ATRIB(7);
    G13 GOON,1;
        ACT,,NNACT(36).EQ.0,G14;                         HOLD REVIEWERS UNTIL
        ACT,3,,G13;                                      PROJECTS COMPLETE
    G14 FREE,MDEE/ATRIB(7);                              REVIEW ACTIVITY IN
        FREE,BDEE/ATRIB(7);                              MAIN PROGRAM(ACT/36).
    G15 GOON,1;
        ACT,,NNACT(37).EQ.0,G16;
        ACT,3,,G15;
    G16 FREE,AFRCE/ATRIB(7);
        GOON,1;
        FREE,COE/ATRIB(7);
        TERMINATE;
  ;
  ;
  ;
  ;     * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  ;
  ;      * * * * * * * * * *  MAIN PROGRAM   * * * * * * * * * * * *
  ;
  ;     * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  ;
  ;
  ;       PROCESSING OF MCP PROJECTS IS ACCOMPLISHED IN THIS PART OF
  ; THE PROGRAM.  THE PRECEEDING SEGMENTS CONTROL THE MCP MILESTONES
  ; SUCH AS THE PROJECT CALLS IN JULY AND NOVEMBER AND THE START OF
  ; NEW FY. THEY ALSO CONTROL PROJECT GROUP PROCESSING WHEN REQUIRED.
        CREATE,0,30,,20;
        ACT,,,M0;
        CREATE,17,47;
  M0    GOON;                                            GATE NEED, RELEASE IS
        AWAIT(44/20),NEED,BALK(M9);                      CONTROLED IN SEGMENT A
        ASSIGN,ATRIB(10) = XX(88);                       TIME FRP RELEASED.
        ACT;
        ASSIGN,XX(4) = XX(4)+1;                          COUNT PROJECTS.
        ASSIGN,ATRIB(9) = UNFRM(0,4,2);                  ASSIGN PRIORITY.
        ASSIGN,ATRIB(7) = 1;                             IDENTIFY BED DOWN PROJ.
        ASSIGN,ATRIB(2) = 0;
        ACT,,,M2;
        GOON,1;
        ACT,,.85,M1;                                     FACILITY REQUIREMENT
  ;                                                      PLAN ADEQUATE TO
  ;                                                      START PROGRAMMING.
        ACT,,.15;                                        FACILITY REQUIREMENT
  ;                                                      PLAN (FRP) INADEQUATE.
        GOON,1;
        ACT/2,UNFRM(140,185),,M2;                        FRP REVISED.
  M1    GOON,1;
        ACT,,.95,M2;                                     95% HAVE CONSTRUCTION
        ACT,,.05;                                        SITE IDENTIFIED.
        ASSIGN,ATRIB(2) = TNOW;
```

```
       AWAIT(2),BASE/1;                     WAITING FOR SITE TO
       ACT/1,RNORM(90,50,1);                BE SELECTED.
       FREE, BASE/1;
       ASSIGN,ATRIB(2) = TNOW - ATRIB(2);   TIME SITE ASSIGNED.
M2     ASSIGN,ATRIB(1) = TNOW;
       AWAIT(1),REQ/1;                      ASSEMBLE SITE SURVEY
       AWAIT(9),BDEE/1;                     TEAM.
       AWAIT(52),MPROG/1;
       ACT/3,UNFRM(4,14);                   SURVEY AT SELECTED
       FREE,BDEE/1;                         BASE.
       FREE,MPROG/1;
       ACT/4,UNFRM(30,50);                  PREPARE 1391'S AND
;                                           PROJECT BOOKLETS (PB).
       FREE,REQ/1;
       ACT,,,M3;
M2A    ASSIGN,ATRIB(7) = 4;                 IDENTIFY RETURNED
;                                           PROJECTS.
M3     AWAIT(3),MPROG/1;                    MAJCOM PROGRAMMER
       ACT/5,UNFRM(3,10);                   MAJCOM REVIEW.
       FREE,MPROG/1;                        MAJCOM PROGRAMMER
       ACT/6,UNFRM(7,30);                   REVIEW AND COORDIN.
       AWAIT(4),REQ/1;                      BASE PROGRAMMER
       ACT/7,EXPON(5,3);                    REVISE PB'S
       FREE,REQ/1;
       AWAIT(5),MPROG/1;
       ACT/8,UNFRM(10,16);                  MAJCOM REV. AND PREP.
;                                           FOR TRANSMITTAL TO
       FREE,MPROG/1;                        USAF/LEE.
       ACT,UNFRM(9,25);                     TIME FOR PRINTING AND
       GOON,1;                              TRANSMITTAL.
       ACT,,ATRIB(7).EQ.4,M7;
       ACT;
       COLCT,INT(1),TIME TO USAF;
       GOON,1;
       ACT,,,M7;
       CREATE,2,2,4;                        ALL NON-MODERNIZATION
       ACT,UNFRM(95,170);                   PROJECTS FROM OTHER
                                            MAJCOMS.
       ASSIGN,ATRIB(9) = UNFRM(0,4);        ASSIGN PRIORITY
       ASSIGN,ATRIB(7) = 2;                 IDENTIFY PROJS. FROM
;                                           OTHER MAJCOMS (NON-
       ACT,,,M7;                            MODERNIZATION).
       CREATE,0,0,4,250;
       ASSIGN,ATRIB(7) = 3;                 IDENTIFY MODERNIZA-
;                                           TION PROJECTS.
       ACT,,,M4;
;
       CREATE,1,10,4;                       ALL AF MODERNIZATION
       ASSIGN,ATRIB(7) = 3;                 PROJECTS SENT TO HQ
M4     GOON;                                USAF/LEE.
       AWAIT(6/250),OTHER,BALK(M9);         GATE OTHER CONTROL IS
       ASSIGN,ATRIB(4) = TNOW;              IN SEGMENT A.
```

```
      ASSIGN,XX(6) = XX(6) + 1;
      ACT,UNFRM(115,130);
      GOON,1;
      ACT,,.80,M5;
      ACT,,.20;
      ASSIGN,ATRIB(9) = UNFRM(0,1);          20% ASSIGNED PRI. 1.
      ACT,,,M6;
M5    ASSIGN,ATRIB(9) = UNFRM(1,4);          ASSIGN REMAINING PRI.
M6    AWAIT(8),CALL;                         USAF CALL FOR MCP
      AWAIT(53),HOLD;                        MODERNIZATION PROJS.
      ASSIGN,XX(2) = XX(2)+1;
      ACT,,,M8;                              GATE CONTROL,SEG. B
M7    AWAIT(10),CALLN;                       USAF CALL FOR NON-
      AWAIT(54),HOLD1;                       MODERNIZATION PROJS
;
;                                            IN NOVEMBER.
      ASSIGN,XX(15) = XX(15) + 1;
      ACT;                                   GATE CONTROL,SEGMENT B
M8    GOON,1;
      ACT/9,UNFRM(1,3);                      PREPARE FOR FACILITY
      GOON;                                  PANEL (F PANEL).
      ACT/10,UNFRM(2,4);                     F PANEL REVIEW.
      AWAIT(14),FRC;
      GOON,1;
      ACT,,ATRIB(7).EQ.4,M10;
      ACT;
      ASSIGN,ATRIB(5) = 0;
      GOON,1;
      ACT,,ATRIB(7).NE.1,M8A;
      ACT,,,M12;
      GOON,1;
      ACT,,.75,M10;
      ACT,,.25,M8A;
M8A   GOON,1;
      ACT/11,,.65,M10;                       35% REJECTED.
      ACT,,.35;
      GOON,1;                                REJECTED BED DOWN
      ACT/12,,ATRIB(7).EQ.1,M2A;             PROJECTS SENT BACK
      ACT;                                   TO MAJCOM --M2A.
M9    TERMINATE;
M10   GOON,1;
      ACT/13,,.73,M12;
      ACT/14,,.27;                           27% REQUIRE TITLE 10,
      ASSIGN,ATRIB(8) = TNOW;                2807 ACTION BY CONG.
      ASSIGN,XX(5) = XX(5)+1;
      AWAIT(16),CONG28;
      ACT/15,XX(1);                          STAFF 2807 ACTION
      GOON,1;
      ACT/16,,.95,M11;
      ACT/17,,.05;                           CONGRESS QUESTIONS
      GOON;                                  ON 5% OF PROJECTS.
      ACT/18,UNFRM(2,18);                    CONG. QUESTIONS
```

```
;                                          RETURNED TO LEECC.
      AWAIT(17),LEECD/1;
      AWAIT(17),LEECD/1;
      ACT/19,UNFRM(3,10);                  PREPARE RESPONSE
;                                          FOR CONGRESS.
      FREE,LEECD/1;
M11   GOON;
      ACT/20,21;                           WAIT 21 DAYS BEFORE
      ASSIGN,ATRIB(5) = TNOW - ATRIB(8);   RELEASE FROM CONG.
M12   AWAIT(18),LEECD/1;
      ACT/21,UNFRM(0,1);                   ISSUE DESIGN INSTRUC-
      FREE,LEECD/1;                        TION.
      GOON,1;
      AWAIT(21),DISTR;                     RELEASE OF DI(35%)
      GOON,1
      ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M13;
      ACT;
      GOON,1;
      ACT,,.20,M14;
      ACT/22,,.80;                         PROJS. TO OTHER
      COLCT,INT(4),DI OTHER AFRCES;        AFRCES.
      TERMINATE;
M13   COLCT,INT(1),DI ISSUED;
      ACT,,,M15;
M14   COLCT,INT(4),DI FOR OTHER PROJ;
M15   GOON,1;
      ACT/23,,.60,M16;
      ACT/24,,.40;
      AWAIT(22),REQ/1;                     BASE REVISE PB & 1391
      ACT/25,UNFRM(4,9);
      FREE,REQ/1;
M16   GOON;
      AWAIT(24),DI;                        DESIGN INSTRUCTION
      ACT/26,UNFRM(3,6);                   ISSUED COE BY AFRCE.
      AWAIT(28),CORPS;
      ASSIGN,XX(7) = XX(7) + 1;            COUNT PROJECTS.
      ASSIGN,ATRIB(8) = TNOW;
      ASSIGN,ATRIB(3) = XX(8);             TIME FOR PREPARATION
;                                          OF A DESIGN SCHEDULE.
      GOON;
      ACT/27,XX(9);                        PREPARE COMMERCE BUS.
      GOON;                                DAILY (CBD) AD.
      ACT/28,UNFRM(20,55);                 ADVERTIZE AND AWAIT
;                                          AE RESPONSE.
      GOON;
      ACT/29,XX(10);                       AE SELECTION.
NA    GOON;
      ASSIGN,ATRIB(6) = TNOW - ATRIB(8);   CHECK TIME FOR PREP.
      ASSIGN,ATRIB(6) = ATRIB(6) - ATRIB(3);  OF COE FINAL DESIGN
      GOON,1;                              SCHEDULE.
      ACT,,ATRIB(6).GE.0,NO;
      ACT,1,,NA;
```

```
NO    GOON,1;
      ACT/30,UNFRM(45,100);                        ISSUE NOTICE TO
 ;                                                 PROCEED TO AE.
      GOON;
      ACT/31,UNFRM(60,120);                        30% DESIGN COMPLETION.
      GOON,1;
      ACT,,ATRIB(7).NE.1.AND.ATRIB(7).NE.4,M17;    PROJS OTHER THAN
      ACT/32,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4;      WEAPON SYS (WS) PROJS.
      GOON;
      COLCT,INT(1),TIME TO 30%;
      ACT,,,M18;
M17   COLCT,INT(4),OTHERS TO 30%;                  SYSTEM TIME STATS.
M18   ASSIGN,ATRIB(8) = TNOW - ATRIB(2);
      GOON,1;
      ACT,,ATRIB(2).EQ.0,M19;                      SEPARATE SITE DELAYED
      ACT,,ATRIB(2).NE.0;                          FROM THOSE WHICH HAD
      GOON;                                        SITE ASSIGNED.
      COLCT,INT(8),HOST BASE ASSIGNED;             SITE ASSIGNMENT STATS.
M19   GOON,1;
      ACT,,ATRIB(5).EQ.0,M20;                      COLLECT STATS ONLY ON
      ACT,,ATRIB(5).NE.0;                          PROJS WHICH HAD DELAY.
      ASSIGN,ATRIB(5) = TNOW - ATRIB(5);
      COLCT,INT(5),CONG. DELAY;
M20   GOON;
      AWAIT(30),REV30;                             30% DESIGN REVIEW.
      ASSIGN,ATRIB(6) = XX(22);
      ACT/33,XX(21);                               PREPARE FOR DIST OF
      GOON,1;                                      30% DESIGN PACKAGE.
      ACT;
      ASSIGN,ATRIB(6) = 45 - TNOW + ATRIB(6);      TIME REMAINING FOR
      GOON,1;                                      30% REVIEW.
      ACT/34,,ATRIB(6).LE.0,M21;                   REVIEW TIME EXPIRED,
                                                   NO INPUT FROM AFRCE.
      ACT/35,,ATRIB(6).GT.0;                       REVIEW TIME REMAINING.
      GOON;
      ACT/36,ATRIB(6);                             ACCOMPLISH REVIEW.
M21   GOON,1;
      ACT,UNFRM(4,12);                             AFRCE COMPILES AND
      GOON;                                        GIVES COMMENTS TO COE.
      ACT,UNFRM(1,2);                              DESIGN REVIEW MEETING.
      GOON;
      ACT/37,UNFRM(5,15);                          CORPS COMPILES REVIEW
      GOON;                                        COMMENTS.
      ACT,UNFRM(20,30);                            AE MAKES CHANGES AND
      AWAIT(34),COE/1;                             RETURNS 35% DESIGN.
      ACT/38,UNFRM(2,5);                           COE FORWARDS TO AFRCE.
      FREE,COE/1;
      AWAIT(35),AFRCE/1;                           AFRCE PREPARES 1178 &
      ACT,UNFRM(0,2);                              FORWARDS TO LEECC.
      FREE,AFRCE/1;
      AWAIT(37),CALL2;                             PROJECTS TO LEECC ON
                                                   1 AUGUST EACH YEAR.
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```
        ACT/39,EXPON(60);                                  OSD REVIEWS & INCLUDES
        GOON,1;                                            PROJECTS IN BUDGET.
        AWAIT(38),DI100;                                   AUTHORIZED TO PROCEED
    ;                                                      WITH DESIGN TO 100%.
        ASSIGN,XX(3) = XX(3) + 1;
        GOON,1;
        ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M22;
        ACT;
        GOON,1;
        ACT/40,,.95,M22;                                   95% TO CONGRESS IN
        ACT,,.05;                                          BUDGET, 5% CANCELLED
        TERMINATE;                                         & PROJECT TERMINATED.
    M22 GOON;
        ACT/41,UNFRM(165,185);                             CONG. REVIEWS & PASSES
        GOON,1;                                            MCP CONSTRUCTION BILL.
        ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M23;           WEAPONS SYS. PROJECTS
        ACT;                                               APPROVED FOR CONSTR.
        GOON,1;
        ACT,,.95,M23;                                      95% INCLUDED IN MCP
        ACT,,.05;                                          BILL, 5% NOT INCLUDED
        TERMINATE;                                         CANCELL DESIGN & PROJ.
    M23 GOON;
        ACT/42,UNFRM(60,80);                               CONGRESS/OSD PROVIDE
    ;                                                      FUNDING FOR CONSTR.
        GOON;
        ACT,UNFRM(2,3);                                    NOTIFY MAJCOM'S ECT.
        GOON;                                              PROJECTS FUNDED.
        ACT/43,UNFRM(15,25);                               COMPLETE 95% DESIGN
    ;                                                      REVIEW (ALL PARTIES).
        GOON;
        ACT,UNFRM(17,30);                                  AE MAKES CHANGES.
        GOON;
        ACT/44,UNFRM(15,25);                               COE CHECKS DESIGN TO
    ;                                                      INSURE ALL COMMENTS
        AWAIT(42),NEWFY;                                   WERE INCORPORATED.
        GOON;                                              START NEW FY 1 OCT.
        AWAIT(41),COE/1;
        ACT,EXPON(2);                                      COE PREPARES CBD AD.
    ;                                                      FOR CONSTRUCTION.
        FREE,COE/1;
        ACT/45,UNFRM(35,50);                               ADVERTISE FOR PROJECT
        GOON;                                              CONSTRUCTION CONTRACT.
        ACT/46,UNFRM(4,10);                                CONTRACT AWARD.
        GOON;
        ACT,UNFRM(7,14);                                   NOTICE TO PROCEED.
    N   GOON;
        ACT/47,UNFRM(285,720);                             FACILITY CONSTRUCTION
        ASSIGN,ATRIB(3) = 0;                               PERIOD ASSIGNED.
        GOON,1;
        ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M28
        ACT;
        GOON,1;
```

```
        ACT,,.40,M28;
        ACT,,.60;                                CONSTRUCTION CHANGES
M24     GOON,1;                                  ON 60% OF THE PROJECTS.
        ACT,,.80,M26;
        ACT,,.05,M27;
        ACT,,.15;                                ON 15% OF THE PROJS
M25     GOON,1;                                  CUMMULATIVE CHANGES
        AWAIT(45),COE/1;                         TOTAL BETWEEN 5% &
        ACT,UNFRM(1,3);                          15% OF THE PROGRAMMED
        FREE,COE/1                               AMOUNT.
        AWAIT(46),AFRCE/1;                       COE FORWARDS TO AFRCE.
        ACT,EXPON(2);
        FREE,AFRCE/1;                            AFRCE FORWARDS TO USAF.
        AWAIT(47),LEECC/1;                       USAF/LEECC PROCESSES
        ACT/49,UNFRM(5,7);                       REQUEST FOR FUNDS.
        FREE,LEECC/1;
        ASSIGN,ATRIB(3) = ATRIB(3) + 1;          CHANGES PER PROJECT.
        GOON,1;
        ACT,,.55,M28;                            55% NO FURTHER CHANGE.
        ACT,,.45;                                45% GET MORE CHANGES.
        GOON,1;                                  AF AVE. IS 2.5 /PROJ.
        ACT,,ATRIB(3).EQ.2,M27;                  NEXT CHANGE WILL CAUSE
;                                                INCREASE TO EXCEED 25%
;                                                OF PA. THEREFORE REQ.
                                                 CONG.ACTION(GO TO M27).
        ACT,,,M25;                               CHECK FOR MORE CHANGES.
M26     ASSIGN,ATRIB(3) = ATRIB(3)  + 1;         COUNT CHANGES PER PROJ.
        AWAIT(48),COE/1;
        ACT/48,UNFRM(5,7);                       CUMMULATIVE CHANGE
        FREE,COE/1;                              COST DOES NOT EXCEED
;                                                5% OF PROJECT PRO-
        GOON,1;                                  GRAMMED AMOUNT (PA).
        ACT,,.20,M28;                            20% RECEIVE NO MORE
        ACT,,.80;                                CONSTR. CHANGES.
        GOON,1;                                  CHECK # OF CHANGES.
        ACT,,ATRIB(3).EQ.3,M28;                  ALLOW A MAXIMUM OF 3
        ACT,,,M24;                               CHANGES PER PROJECT.
M27     GOON,1;
        ASSIGN,ATRIB(3) = ATRIB(3) + 1;          COUNT CHANGES PER PROJ.
        AWAIT(49),COE/1;
        ACT,UNFRM(1,2);                          CUMMULATIVE COST OR
        FREE,COE/1;                              COST OF THIS CHANGE
        AWAIT(50),AFRCE/1;                       EXCEEDS 25% OF PROJ.
        ACT,EXPON(2);                            PA, AFRCE FORWARDS TO
        FREE,AFRCE/1;                            HQ USAF/LEECC.
        AWAIT(51),LEECC/1;
        ACT,UNFRM(5,7);                          LEECC FORWARDS TO CONG.
        FREE,LEECC/1;
        ACT/50,UNFRM(45,60);                     CONGRESS REVIEWS AND
        GOON,1;                                  APPROVES ADDED FUNDS.
        ACT,,.65,M28;                            65% RECEIVE NO FURTHER
        ACT,,.35;                                CHANGES.
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```
     GOON,1;
     ACT,,ATRIB(3).GT.1,M28;                        MAX. OF 2 CHANGES PER
     ACT,,,M24;                                     PROJ. (AF AVE IS 2.5)
M28  ASSIGN,ATRIB(8) = TNOW - ATRIB(7);
     COLCT,INT(8),TYPE PROJECT,4,0,1;               TYPE OF PROJ.COMPLETED
     ASSIGN,ATRIB(3) = TNOW - ATRIB(3);
     COLCT,INT(3),CONSTR. CHANGES,3/0/1;            NUMBER OF CHANGES.
     GOON,1;
     ACT,,ATRIB(7).NE.1.AND.ATRIB(7).NE.4,M33;      OTHER PROJECTS SORTED.
     ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4;
     COLCT,INT(1),TIME COMPLETE;                    CONSTR. COMPLETE TIME.
     ASSIGN,ATRIB(10) = ATRIB(10) + UNFRM(100,365) + 1825;
     ASSIGN,ATRIB(10) = TNOW - ATRIB(10);           IOC CALCULATED.
     GOON,1;
     ACT,,ATRIB(10).GT.0,M29;                       PROJ. COMPLETED LATE.
     ACT,,ATRIB(10).LT.0,M30;                       PROJ. COMPLETED EARLY.
     ACT,,ATRIB(10).EQ.0,M31;                       PROJECT ON TIME.
M29  ASSIGN,ATRIB(10) = 3;                          3 = MISSED IOC.(LATE)
     ACT,,,M32;
M30  ASSIGN,ATRIB(10) = 1;                          1 = PRIOR TO IOC.
     ACT,,,M32;
M31  ASSIGN,ATRIB(10) = 2;                          2 = READY AT IOC.
M32  GOON,1;
     ASSIGN,ATRIB(10) = TNOW - ATRIB(10);
     COLCT,INT(10),DELIVERY STATUS,3/0/1;           DELIVERY TIME STATS.
     GOON,1;
     ASSIGN,ATRIB(9) = TNOW - ATRIB(9);             CALCULATE PRIORITY.
     COLCT,INT(9),PRIORITY,4/0/1;                   BED DOWN PROJ.PRIORITY
     ACT,,,M34;
M33  GOON;
     COLCT,INT(4),OTHERS COMPLETE;                  OTHERS PROJ. COMPLETE.
     GOON;
     ASSIGN,ATRIB(9) = TNOW - ATRIB(9);             CALCULATE & COLLECT
     COLCT,INT(9),PRIORITY OTHERS,4/0/1;            STATS ON PRIORITY OF
M34  GOON,1;                                        ALL OTHER PROJECTS.
     ENDNETWORK;                                    END OF SIMULATION.
;
;
INIT,0,5840;                                        SIMULATE 10 YRS. PLUS
;                                                   6 YR. WARM-UP PERIOD.
MONTR,SUMRY,2190,365
MONTR,CLEAR,2190,365;                               COLLECT STATS. EVERY
FIN;                                                YEAR STARTING AT YR. 6.
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Immediately following this program listing are the results of the simulation run. An explanation and definition of the statistics printed in the SLAM Summary Report are included as Appendix G.

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL        BY BLAKE & MARCHBANKS

DATE 8/16/1985        RUN NUMBER 1 OF 1

CURRENT TIME .2190E+04
STATISTICAL ARRAYS CLEARED AT TIME .0000E+00

END OF WARM-UP PERIOD

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .192E+03 | .550E+02 | .287E+00 | .906E+02 | .296E+03 | 122 |
| DI OTHER AFRCES | .434E+03 | .125E+03 | .287E+00 | .121E+03 | .620E+03 | 1130 |
| DI ISSUED | .314E+03 | .122E+03 | .387E+00 | .226E+03 | .661E+03 | 119 |
| DI FOR OTHER PRO | .443E+03 | .122E+03 | .276E+00 | .140E+03 | .620E+03 | 283 |
| TIME TO 30% | .557E+03 | .118E+03 | .213E+00 | .441E+03 | .925E+03 | 98 |
| OTHERS TO 30% | .693E+03 | .138E+03 | .199E+00 | .376E+03 | .943E+03 | 231 |
| CONG. DELAY | .784E+02 | .365E+02 | .465E+00 | .592E+02 | .263E+03 | 56 |
| TYPE PROJECT | .167E+01 | .837E+00 | .500E+00 | .100E+01 | .300E+01 | 43 |
| CONSTR. CHANGES | .512E+00 | .103E+01 | .202E+01 | .000E+00 | .300E+01 | 43 |
| TIME COMPLETE | .168E+04 | .166E+03 | .991E-01 | .135E+04 | .202E+04 | 24 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 24 |
| PRIORITY | .157E+01 | .109E+01 | .694E+00 | .755E-01 | .400E+01 | 24 |
| OTHERS COMPLETE | .187E+04 | .210E+03 | .112E+00 | .127E+04 | .211E+04 | 19 |
| PRIORITY OTHERS | .190E+01 | .124E+01 | .656E+00 | .567E-01 | .387E+01 | 19 |

REMAINDER OF STATISTICS FOR WARM-UP PERIOD NOT INCLUDED.

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL    BY BLAKE & MARCHBANKS

DATE 8/16/1985    RUN NUMBER 1 OF 1

CURRENT TIME .2555E+04
STATISTICAL ARRAYS CLEARED AT TIME .2190E+04

END OF YEAR 7

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .188E+03 | .537E+02 | .286E+00 | .973E+02 | .292E+03 | 20 |
| DI OTHER AFRCES | .446E+03 | .120E+03 | .269E+00 | .149E+03 | .625E+03 | 226 |
| DI ISSUED | .346E+03 | .134E+03 | .387E+00 | .291E+03 | .656E+03 | 20 |
| DI FOR OTHER PRO | .465E+03 | .118E+03 | .252E+00 | .181E+03 | .625E+03 | 62 |
| TIME TO 30% | .559E+03 | .129E+03 | .231E+00 | .449E+03 | .869E+03 | 21 |
| OTHERS TO 30% | .682E+03 | .987E+02 | .145E+00 | .451E+03 | .831E+03 | 58 |
| CONG. DELAY | .697E+02 | .289E+00 | .414E-02 | .696E+02 | .702E+02 | 13 |
| TYPE PROJECT | .226E+01 | .829E+00 | .367E+00 | .100E+01 | .300E+01 | 90 |
| CONSTR. CHANGES | .867E+00 | .119E+01 | .138E+01 | .000E+00 | .300E+01 | 90 |
| TIME COMPLETE | .183E+04 | .215E+03 | .117E+00 | .141E+04 | .213E+04 | 22 |
| DELIVERY STATUS | .109E+01 | .426E+00 | .391E+00 | .100E+01 | .300E+01 | 22 |
| PRIORITY | .164E+01 | .128E+01 | .780E+00 | .319E-01 | .391E+01 | 22 |
| OTHERS COMPLETE | .205E+04 | .256E+03 | .125E+00 | .124E+04 | .249E+04 | 68 |
| PRIORITY OTHERS | .181E+01 | .116E+01 | .644E+00 | .522E-01 | .394E+01 | 68 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.601 | 4.823 | 14 | 0 | 65.710 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .122 | .417 | 2 | 0 | 2.234 |
| 4 | AWAIT | .338 | .883 | 4 | 0 | 6.171 |
| 5 | AWAIT | .036 | .217 | 3 | 0 | .649 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.148 | 82.011 | 251 | 251 | 158.614 |
| 9 | AWAIT | .046 | .217 | 2 | 0 | .834 |
| 10 | AWAIT | 67.313 | 52.996 | 169 | 29 | 104.107 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 12 | AWAIT | .359 | .480 | 1 | 0 | 18.730 |
| 13 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 14 | AWAIT | 32.807 | 71.539 | 251 | 0 | 26.145 |
| 15 | AWAIT | .000 | .021 | 1 | 0 | .082 |
| 16 | AWAIT | 4.281 | 11.966 | 45 | 0 | 21.404 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 6.423 | 21.045 | 123 | 0 | 8.084 |
| 19 | AWAIT | .252 | .434 | 1 | 0 | 18.383 |
| 20 | AWAIT | .018 | .134 | 1 | 0 | 1.339 |
| 21 | AWAIT | 22.460 | 33.345 | 124 | 0 | 26.617 |
| 22 | AWAIT | 1.470 | 3.513 | 11 | 0 | 17.888 |
| 23 | AWAIT | .295 | .456 | 1 | 0 | 15.372 |
| 24 | AWAIT | 4.229 | 6.190 | 30 | 0 | 18.826 |
| 25 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 26 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 27 | AWAIT | .002 | .047 | 1 | 0 | .403 |
| 28 | AWAIT | .081 | .704 | 14 | 0 | .359 |
| 29 | AWAIT | .002 | .048 | 1 | 0 | .060 |
| 30 | AWAIT | 1.646 | 1.572 | 6 | 3 | 7.237 |
| 31 | AWAIT | 1.321 | 1.941 | 5 | 0 | 34.431 |
| 32 | AWAIT | 1.496 | 1.842 | 4 | 0 | 39.004 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | 1.573 | 4.171 | 18 | 0 | 7.177 |
| 35 | AWAIT | 6.335 | 10.861 | 38 | 0 | 28.199 |
| 36 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 37 | AWAIT | 21.787 | 18.809 | 64 | 64 | 82.835 |
| 38 | AWAIT | .030 | .180 | 2 | 0 | .330 |
| 39 | AWAIT | .015 | .120 | 1 | 0 | .484 |
| 40 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 41 | AWAIT | 7.181 | 11.739 | 32 | 0 | 41.604 |
| 42 | AWAIT | 11.308 | 10.258 | 35 | 3 | 62.539 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.581 | 6.107 | 20 | 19 | 99.026 |
| 45 | AWAIT | .434 | .929 | 4 | 0 | 13.211 |
| 46 | AWAIT | .326 | .469 | 1 | 0 | 10.807 |
| 47 | AWAIT | .052 | .350 | 3 | 0 | 1.579 |
| 48 | AWAIT | 3.172 | 5.446 | 17 | 0 | 15.858 |
| 49 | AWAIT | .275 | .474 | 2 | 0 | 12.564 |
| 50 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 51 | AWAIT | .009 | .096 | 1 | 0 | .427 |
| 52 | AWAIT | .133 | .482 | 3 | 0 | 2.430 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 55 | CALENDAR | 456.528 | 137.873 | 870 | 375 | 10.082 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .4517 | .9768 | 5 | 0 | 20 |
| 4 | 2.2364 | 2.2260 | 6 | 0 | 20 |
| 5 | .3507 | .6753 | 3 | 0 | 20 |
| 6 | .8425 | 1.1746 | 5 | 0 | 20 |
| 7 | .2971 | .6334 | 3 | 0 | 20 |
| 8 | .7255 | 1.0410 | 4 | 0 | 20 |
| 9 | 2.5044 | 20.1356 | 251 | 0 | 458 |
| 10 | 3.7932 | 23.1197 | 251 | 0 | 458 |
| 11 | .0000 | .0000 | 1 | 0 | 288 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 215 |
| 14 | .0000 | .0000 | 1 | 0 | 73 |
| 15 | 7.1836 | 15.5816 | 45 | 0 | 73 |
| 16 | .0000 | .0000 | 1 | 0 | 69 |
| 17 | .0000 | .0000 | 1 | 0 | 4 |
| 18 | .1569 | .5812 | 3 | 1 | 3 |
| 19 | .0473 | .2640 | 2 | 0 | 3 |
| 20 | 3.6021 | 10.8458 | 43 | 27 | 45 |
| 21 | .4088 | 1.0867 | 5 | 0 | 295 |
| 22 | .0000 | .0000 | 1 | 0 | 226 |
| 23 | .0000 | .0000 | 1 | 0 | 52 |
| 24 | .0000 | .0000 | 1 | 0 | 30 |
| 25 | .5251 | 1.3989 | 6 | 0 | 30 |
| 26 | .9907 | 4.4601 | 35 | 0 | 82 |
| 27 | 2.9487 | 8.4671 | 39 | 0 | 82 |
| 28 | 6.5138 | 11.1147 | 55 | 51 | 68 |
| 29 | 1.1981 | 2.7603 | 16 | 0 | 73 |
| 30 | 14.4767 | 15.7510 | 50 | 11 | 79 |
| 31 | 19.8482 | 14.6102 | 50 | 14 | 79 |
| 32 | .0000 | .0000 | 1 | 0 | 21 |
| 33 | .3794 | 1.4414 | 7 | 0 | 80 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 80 |
| 36 | 9.4763 | 8.0832 | 35 | 0 | 80 |
| 37 | 2.1128 | 2.4735 | 10 | 0 | 80 |
| 38 | .7693 | 1.3154 | 10 | 0 | 82 |
| 39 | 4.8873 | 6.5716 | 33 | 2 | 33 |
| 40 | .0000 | .0000 | 1 | 0 | 21 |
| 41 | 20.7144 | 13.2204 | 48 | 28 | 49 |
| 42 | 9.4735 | 9.3548 | 27 | 0 | 49 |
| 43 | 2.7348 | 3.0548 | 10 | 0 | 50 |
| 44 | 2.8244 | 2.8352 | 9 | 0 | 53 |
| 45 | 7.3959 | 11.6133 | 32 | 1 | 62 |
| 46 | 1.0289 | 2.9293 | 19 | 17 | 45 |
| 47 | 137.2751 | 20.5154 | 173 | 111 | 95 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | 1.2051 | 2.3388 | 13 | 1 | 72 |
| 49 | .2167 | .6412 | 4 | 1 | 12 |
| 50 | .8055 | 1.2737 | 5 | 5 | 4 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0274 | .1632 | 1 | 0 | 2 |
| 94 | .0000 | .0000 | 1 | 0 | 5 |
| 95 | .0000 | .0000 | 1 | 0 | 11 |
| 97 | .0959 | .2944 | 1 | 0 | 7 |
| 98 | .0767 | .2661 | 1 | 0 | 7 |
| 99 | .0384 | .1921 | 1 | 0 | 14 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.34 | 1.815 | 5 | 0 |
| 2 | LEECC | 6 | 2.02 | 1.923 | 6 | 2 |
| 3 | REQ | 6 | 3.69 | 2.597 | 6 | 0 |
| 4 | BDEE | 7 | 2.89 | 2.197 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 2.31 | 1.739 | 4 | 0 |
| 7 | MPROG | 5 | 1.82 | 1.775 | 5 | 0 |
| 8 | AFRCE | 9 | 5.43 | 3.425 | 9 | 1 |
| 9 | COE | 18 | 10.56 | 6.229 | 18 | 10 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.6645 | 0 | 5 |
| 2 | LEECC | 4 | 3.9781 | 0 | 6 |
| 3 | REQ | 6 | 2.3108 | 0 | 6 |
| 4 | BDEE | 7 | 4.1055 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 4 | 1.6904 | 0 | 4 |
| 7 | MPROG | 5 | 3.1786 | 0 | 5 |
| 8 | AFRCE | 8 | 3.5708 | 0 | 9 |
| 9 | COE | 8 | 7.4387 | 0 | 17 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0110 |
| 8 | DI | CLOSED | .0959 |
| 9 | DISTR | CLOSED | .0274 |
| 10 | CORPS | CLOSED | .0767 |
| 11 | REV30 | CLOSED | .0384 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .2110 |
| 14 | HOLD | OPEN | .9890 |
| 15 | HOLD1 | OPEN | .9890 |

**HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 22  .244  .100E+01 +************                                     +
 23  .256  .200E+01 +*************           C                        +
 45  .500  .300E+01 +*************************                        C
  0  .000  .400E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 90                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .226E+01 | .829E+00 | .367E+00 | .100E+01 | .300E+01 | 90 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 53  .589  .000E+00 +*****************************                    +
 13  .144  .100E+01 +*******                             C            +
  7  .078  .200E+01 +****                                    C        +
 17  .189  .300E+01 +*********                                        C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 90                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .867E+00 | .119E+01 | .138E+01 | .000E+00 | .300E+01 | 90 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 21  .955  .100E+01 +************************************************ +
  0  .000  .200E+01 +                                               C +
  1  .045  .300E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 22                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .109E+01 | .426E+00 | .391E+00 | .100E+01 | .300E+01 | 22 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  9  .409  .100E+01 +********************                             +
  5  .227  .200E+01 +***********                     C                +
  3  .136  .300E+01 +*******                                C         +
  5  .227  .400E+01 +***********                                      C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 22                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .164E+01 | .128E+01 | .780E+00 | .319E-01 | .391E+01 | 22 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 20  .294  .100E+01 +***************                                  +
 20  .294  .200E+01 +***************              C                   +
 15  .221  .300E+01 +***********                             C        +
 13  .191  .400E+01 +**********                                       C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 68                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .181E+01 | .116E+01 | .644E+00 | .522E-01 | .394E+01 | 68 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE  8/16/1985                                 RUN NUMBER   1 OF   1

CURRENT TIME  .2920E+04
STATISTICAL ARRAYS CLEARED AT TIME  .2555E+04

END OF YEAR  8

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .173E+03 | .565E+02 | .327E+00 | .795E+02 | .263E+03 | 20 |
| DI OTHER AFRCES | .426E+03 | .942E+02 | .221E+00 | .136E+03 | .579E+03 | 256 |
| DI ISSUED | .327E+03 | .131E+03 | .400E+00 | .275E+03 | .640E+03 | 21 |
| DI FOR OTHER PRO | .409E+03 | .107E+03 | .261E+00 | .162E+03 | .541E+03 | 57 |
| TIME TO 30% | .583E+03 | .150E+03 | .258E+00 | .471E+03 | .957E+03 | 20 |
| OTHERS TO 30% | .716E+03 | .132E+03 | .184E+00 | .408E+03 | .892E+03 | 67 |
| CONG. DELAY | .833E+02 | .898E+01 | .108E+00 | .670E+02 | .101E+03 | 16 |
| TYPE PROJECT | .217E+01 | .837E+00 | .386E+00 | .100E+01 | .300E+01 | 105 |
| CONSTR. CHANGES | .114E+01 | .135E+01 | .119E+01 | .000E+00 | .600E+01 | 105 |
| TIME COMPLETE | .178E+04 | .283E+03 | .159E+00 | .126E+04 | .232E+04 | 29 |
| DELIVERY STATUS | .134E+01 | .769E+00 | .572E+00 | .100E+01 | .300E+01 | 29 |
| PRIORITY | .157E+01 | .113E+01 | .719E+00 | .385E-01 | .384E+01 | 29 |
| OTHERS COMPLETE | .200E+04 | .301E+03 | .151E+00 | .140E+04 | .271E+04 | 76 |
| PRIORITY OTHERS | .215E+01 | .114E+01 | .530E+00 | .456E-01 | .398E+01 | 76 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.425 | 4.879 | 14 | 0 | 62.507 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .071 | .390 | 3 | 0 | 1.298 |
| 4 | AWAIT | .288 | .805 | 4 | 0 | 5.261 |
| 5 | AWAIT | .012 | .107 | 1 | 0 | .212 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.632 | 81.586 | 251 | 251 | 158.965 |
| 9 | AWAIT | .022 | .146 | 1 | 0 | .399 |
| 10 | AWAIT | 66.911 | 52.137 | 162 | 37 | 103.485 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 12 | AWAIT | .011 | .103 | 1 | 0 | .647 |
| 13 | AWAIT | .000 | .006 | 1 | 0 | .006 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 14 | AWAIT | 21.465 | 58.057 | 251 | 0 | 17.411 |
| 15 | AWAIT | .005 | .071 | 1 | 0 | .918 |
| 16 | AWAIT | 3.129 | 9.996 | 40 | 0 | 17.847 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 9.917 | 26.742 | 130 | 0 | 10.838 |
| 19 | AWAIT | .051 | .221 | 1 | 0 | 2.083 |
| 20 | AWAIT | .008 | .087 | 1 | 0 | .309 |
| 21 | AWAIT | 9.259 | 21.754 | 118 | 0 | 10.118 |
| 22 | AWAIT | 1.040 | 2.674 | 12 | 0 | 10.541 |
| 23 | AWAIT | .296 | .457 | 1 | 0 | 15.446 |
| 24 | AWAIT | 2.528 | 3.976 | 25 | 0 | 11.827 |
| 25 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 26 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 27 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 28 | AWAIT | .093 | .747 | 14 | 0 | .435 |
| 29 | AWAIT | .002 | .039 | 1 | 0 | .035 |
| 30 | AWAIT | 1.629 | 1.499 | 8 | 3 | 6.608 |
| 31 | AWAIT | .676 | 1.133 | 3 | 0 | 15.412 |
| 32 | AWAIT | 1.168 | 1.718 | 4 | 0 | 26.644 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | .013 | .115 | 1 | 0 | .059 |
| 35 | AWAIT | 5.852 | 12.640 | 51 | 0 | 26.371 |
| 36 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 37 | AWAIT | 48.189 | 31.929 | 80 | 65 | 121.302 |
| 38 | AWAIT | .539 | 2.202 | 17 | 0 | 2.657 |
| 39 | AWAIT | .076 | .264 | 1 | 0 | 1.969 |
| 40 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 41 | AWAIT | .301 | 2.002 | 18 | 0 | 3.787 |
| 42 | AWAIT | 3.465 | 5.102 | 23 | 2 | 40.801 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 11.019 | 6.050 | 20 | 19 | 103.128 |
| 45 | AWAIT | .025 | .155 | 1 | 0 | .498 |
| 46 | AWAIT | .689 | 1.186 | 4 | 0 | 13.245 |
| 47 | AWAIT | .039 | .291 | 3 | 0 | .754 |
| 48 | AWAIT | .030 | .169 | 1 | 0 | .137 |
| 49 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 50 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 51 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 52 | AWAIT | .054 | .236 | 2 | 0 | .987 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .004 | .066 | 1 | 0 | .008 |
| 55 | CALENDAR | 422.642 | 116.004 | 805 | 313 | 9.118 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .4509 | 1.0514 | 5 | 0 | 20 |
| 4 | 2.1358 | 2.2444 | 6 | 0 | 20 |
| 5 | .3504 | .7415 | 3 | 0 | 20 |
| 6 | .8853 | 1.2762 | 4 | 0 | 20 |
| 7 | .3002 | .5771 | 3 | 0 | 20 |
| 8 | .6844 | 1.0356 | 4 | 0 | 20 |
| 9 | 2.4409 | 20.0297 | 251 | 0 | 450 |
| 10 | 3.6496 | 22.8128 | 251 | 0 | 450 |
| 11 | .0000 | .0000 | 1 | 0 | 286 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 222 |
| 14 | .0000 | .0000 | 1 | 0 | 64 |
| 15 | 4.6071 | 11.4178 | 40 | 0 | 64 |
| 16 | .0000 | .0000 | 1 | 0 | 60 |
| 17 | .0000 | .0000 | 1 | 0 | 4 |
| 18 | .1309 | .5195 | 3 | 0 | 5 |
| 19 | .0792 | .3525 | 3 | 0 | 5 |
| 20 | 4.2682 | 10.4687 | 40 | 1 | 91 |
| 21 | .4529 | 1.1065 | 5 | 0 | 334 |
| 22 | .0000 | .0000 | 1 | 0 | 256 |
| 23 | .0000 | .0000 | 1 | 0 | 42 |
| 24 | .0000 | .0000 | 1 | 0 | 36 |
| 25 | .6645 | 1.5374 | 6 | 0 | 36 |
| 26 | .9860 | 3.9008 | 30 | 0 | 78 |
| 27 | 2.3694 | 6.9424 | 39 | 4 | 74 |
| 28 | 9.1855 | 13.5851 | 51 | 41 | 84 |
| 29 | 1.0756 | 2.3828 | 12 | 2 | 82 |
| 30 | 18.2629 | 16.5569 | 55 | 0 | 93 |
| 31 | 22.7379 | 15.7617 | 54 | 20 | 87 |
| 32 | .0000 | .0000 | 1 | 0 | 20 |
| 33 | .7249 | 1.8143 | 8 | 0 | 87 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 87 |
| 36 | 9.7027 | 9.3404 | 35 | 5 | 82 |
| 37 | 2.2130 | 2.8689 | 12 | 0 | 82 |
| 38 | .7486 | 1.1455 | 5 | 1 | 81 |
| 39 | 11.9426 | 18.7169 | 80 | 8 | 74 |
| 40 | .0000 | .0000 | 1 | 0 | 54 |
| 41 | 27.3725 | 25.27[illegible]0 | 72 | 72 | 30 |
| 42 | 5.3901 | 6.2428 | 21 | 0 | 28 |
| 43 | 1.5567 | 2.3655 | 9 | 0 | 28 |
| 44 | 1.4861 | 2.3258 | 9 | 0 | 28 |
| 45 | 3.4028 | 7.3586 | 25 | 0 | 30 |
| 46 | .7604 | 2.4057 | 17 | 0 | 47 |
| 47 | 94.7154 | 21.7839 | 139 | 72 | 98 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | 1.2769 | 1.1229 | 5 | 0 | 90 |
| 49 | .3285 | .5879 | 3 | 0 | 20 |
| 50 | 1.1828 | 1.2858 | 5 | 1 | 10 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0411 | .1985 | 1 | 0 | 3 |
| 94 | .0000 | .0000 | 1 | 0 | 9 |
| 95 | .0000 | .0000 | 1 | 0 | 14 |
| 97 | .0959 | .2944 | 1 | 0 | 7 |
| 98 | .0715 | .2577 | 1 | 1 | 6 |
| 99 | .0438 | .2047 | 1 | 0 | 16 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.48 | 1.896 | 5 | 0 |
| 2 | LEECC | 6 | 2.72 | 2.166 | 6 | 4 |
| 3 | REQ | 6 | 3.63 | 2.665 | 6 | 0 |
| 4 | BDEE | 7 | 2.41 | 2.067 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 1.91 | 1.751 | 4 | 0 |
| 7 | MPROG | 5 | 1.95 | 1.754 | 5 | 2 |
| 8 | AFRCE | 9 | 5.01 | 3.204 | 9 | 3 |
| 9 | COE | 18 | 8.61 | 5.079 | 18 | 4 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.5172 | 0 | 5 |
| 2 | LEECC | 2 | 3.2786 | 0 | 6 |
| 3 | REQ | 6 | 2.3727 | 0 | 6 |
| 4 | BDEE | 7 | 4.5881 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 4 | 2.0932 | 0 | 4 |
| 7 | MPROG | 3 | 3.0537 | 0 | 5 |
| 8 | AFRCE | 6 | 3.9887 | 0 | 9 |
| 9 | COE | 14 | 9.3890 | 0 | 17 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0164 |
| 8 | DI | CLOSED | .0959 |
| 9 | DISTR | CLOSED | .0822 |
| 10 | CORPS | OPEN | .0715 |
| 11 | REV30 | CLOSED | .0438 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .2685 |
| 14 | HOLD | OPEN | .9836 |
| 15 | HOLD1 | OPEN | .9836 |

**HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 29  .276  .100E+01 +**************                                   +
 29  .276  .200E+01 +**************             C                     +
 47  .448  .300E+01 +**********************                           C
  0  .000  .400E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
105                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .217E+01 | .837E+00 | .386E+00 | .100E+01 | .300E+01 | 105 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 53  .505  .000E+00 +*************************                        +
 14  .133  .100E+01 +*******                        C                 +
 11  .105  .200E+01 +*****                               C            +
 26  .248  .300E+01 +************                                     C
  1  .010    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
105                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .114E+01 | .135E+01 | .119E+01 | .000E+00 | .600E+01 | 105 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 24  .828  .100E+01 +*****************************************        +
  0  .000  .200E+01 +                                        C        +
  5  .172  .300E+01 +*********                                        C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 29                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .134E+01 | .769E+00 | .572E+00 | .100E+01 | .300E+01 | 29 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 11  .379  .100E+01 +*******************                              +
  8  .276  .200E+01 +**************                  C                +
  6  .207  .300E+01 +**********                                C      +
  4  .138  .400E+01 +*******                                          C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 29                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .157E+01 | .113E+01 | .719E+00 | .385E-01 | .384E+01 | 29 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 15  .197  .100E+01 +**********                                       +
 19  .250  .200E+01 +*************        C                           +
 20  .263  .300E+01 +*************                      C             +
 22  .289  .400E+01 +**************                                   C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 76                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .215E+01 | .114E+01 | .530E+00 | .456E-01 | .398E+01 | 76 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/16/1985                                 RUN NUMBER 1 OF 1

CURRENT TIME .3285E+04
STATISTICAL ARRAYS CLEARED AT TIME .2920E+04

END OF YEAR 9

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .178E+03 | .500E+02 | .281E+00 | .111E+03 | .255E+03 | 20 |
| DI OTHER AFRCES | .429E+03 | .101E+03 | .236E+00 | .139E+03 | .554E+03 | 217 |
| DI ISSUED | .288E+03 | .113E+03 | .391E+00 | .223E+03 | .629E+03 | 22 |
| DI FOR OTHER PRO | .419E+03 | .114E+03 | .273E+00 | .154E+03 | .569E+03 | 66 |
| TIME TO 30% | .563E+03 | .135E+03 | .240E+00 | .455E+03 | .909E+03 | 21 |
| OTHERS TO 30% | .653E+03 | .120E+03 | .184E+00 | .397E+03 | .902E+03 | 57 |
| CONG. DELAY | .653E+02 | .140E+01 | .214E-01 | .641E+02 | .668E+02 | 9 |
| TYPE PROJECT | .213E+01 | .875E+00 | .411E+00 | .100E+01 | .300E+01 | 47 |
| CONSTR. CHANGES | .104E+01 | .125E+01 | .120E+01 | .000E+00 | .300E+01 | 47 |
| TIME COMPLETE | .184E+04 | .229E+03 | .125E+00 | .158E+04 | .241E+04 | 15 |
| DELIVERY STATUS | .127E+01 | .704E+00 | .556E+00 | .100E+01 | .300E+01 | 15 |
| PRIORITY | .214E+01 | .109E+01 | .511E+00 | .262E+00 | .391E+01 | 15 |
| OTHERS COMPLETE | .196E+04 | .267E+03 | .136E+00 | .151E+04 | .262E+04 | 32 |
| PRIORITY OTHERS | .207E+01 | .103E+01 | .498E+00 | .229E+00 | .387E+01 | 32 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.383 | 4.818 | 14 | 0 | 61.743 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .149 | .551 | 3 | 0 | 2.726 |
| 4 | AWAIT | .323 | 1.056 | 6 | 0 | 5.897 |
| 5 | AWAIT | .025 | .155 | 1 | 0 | .447 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.194 | 82.046 | 251 | 251 | 158.647 |
| 9 | AWAIT | .036 | .259 | 2 | 0 | .653 |
| 10 | AWAIT | 67.852 | 52.895 | 170 | 36 | 104.059 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 12 | AWAIT | .005 | .069 | 1 | 0 | .249 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 13 | AWAIT | .001 | .032 | 1 | 0 | .127 |
| 14 | AWAIT | 9.103 | 37.535 | 251 | 0 | 7.335 |
| 15 | AWAIT | .004 | .060 | 1 | 0 | .654 |
| 16 | AWAIT | 4.575 | 12.543 | 47 | 3 | 17.955 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 8.428 | 21.373 | 115 | 0 | 10.086 |
| 19 | AWAIT | .041 | .199 | 1 | 0 | 1.882 |
| 20 | AWAIT | .006 | .078 | 1 | 0 | .278 |
| 21 | AWAIT | 10.156 | 19.538 | 95 | 0 | 12.154 |
| 22 | AWAIT | .745 | 2.035 | 9 | 0 | 7.556 |
| 23 | AWAIT | .119 | .324 | 1 | 0 | 6.223 |
| 24 | AWAIT | 2.376 | 3.965 | 25 | 0 | 9.855 |
| 25 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 26 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 27 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 28 | AWAIT | .084 | .714 | 15 | 0 | .354 |
| 29 | AWAIT | .001 | .031 | 1 | 0 | .025 |
| 30 | AWAIT | 1.524 | 1.289 | 7 | 2 | 6.867 |
| 31 | AWAIT | .039 | .192 | 1 | 0 | 1.004 |
| 32 | AWAIT | .477 | .977 | 3 | 0 | 12.446 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | .001 | .024 | 1 | 0 | .003 |
| 35 | AWAIT | 1.210 | 3.082 | 14 | 0 | 5.888 |
| 36 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 37 | AWAIT | 48.411 | 36.601 | 93 | 23 | 126.214 |
| 38 | AWAIT | .080 | .419 | 4 | 0 | .252 |
| 39 | AWAIT | .017 | .130 | 1 | 0 | .369 |
| 40 | AWAIT | .097 | .295 | 1 | 0 | 7.050 |
| 41 | AWAIT | .673 | 4.277 | 38 | 0 | 3.365 |
| 42 | AWAIT | 5.224 | 9.906 | 47 | 2 | 25.425 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.573 | 6.180 | 20 | 19 | 98.949 |
| 45 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 46 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 47 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 48 | AWAIT | .015 | .121 | 1 | 0 | .169 |
| 49 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 50 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 51 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 52 | AWAIT | .103 | .451 | 3 | 0 | 1.877 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .011 | .135 | 2 | 0 | .019 |
| 55 | CALENDAR | 436.599 | 104.197 | 789 | 391 | 9.360 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .4618 | .9226 | 4 | 0 | 20 |
| 4 | 2.1192 | 2.1515 | 6 | 0 | 20 |
| 5 | .3153 | .6566 | 3 | 0 | 20 |
| 6 | .9841 | 1.3261 | 5 | 0 | 20 |
| 7 | .2644 | .4971 | 2 | 0 | 20 |
| 8 | .7002 | 1.1052 | 4 | 0 | 20 |
| 9 | 2.5193 | 20.7077 | 251 | 0 | 453 |
| 10 | 3.7391 | 23.4701 | 251 | 0 | 453 |
| 11 | .0000 | .0000 | 1 | 0 | 285 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 192 |
| 14 | .0000 | .0000 | 1 | 0 | 93 |
| 15 | 10.1771 | 18.8877 | 47 | 0 | 90 |
| 16 | .0000 | .0000 | 1 | 0 | 87 |
| 17 | .0000 | .0000 | 1 | 0 | 3 |
| 18 | .0701 | .3209 | 2 | 0 | 3 |
| 19 | .0515 | .2416 | 2 | 0 | 3 |
| 20 | 5.1900 | 13.9898 | 47 | 0 | 91 |
| 21 | .4234 | .9987 | 5 | 0 | 305 |
| 22 | .0000 | .0000 | 1 | 0 | 217 |
| 23 | .0000 | .0000 | 1 | 0 | 52 |
| 24 | .0000 | .0000 | 1 | 0 | 36 |
| 25 | .6618 | 1.4966 | 6 | 0 | 36 |
| 26 | 1.0705 | 3.6861 | 25 | 1 | 87 |
| 27 | 2.4023 | 5.8997 | 25 | 14 | 77 |
| 28 | 8.7949 | 10.6658 | 43 | 22 | 96 |
| 29 | 1.4982 | 2.5850 | 13 | 5 | 93 |
| 30 | 15.1157 | 12.6881 | 46 | 21 | 72 |
| 31 | 17.3650 | 12.7347 | 44 | 14 | 78 |
| 32 | .0000 | .0000 | 1 | 0 | 21 |
| 33 | .7203 | 2.0379 | 12 | 0 | 79 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 79 |
| 36 | 8.5989 | 7.6044 | 24 | 10 | 74 |
| 37 | 2.0314 | 2.8050 | 11 | 0 | 74 |
| 38 | .7588 | 1.2081 | 6 | 0 | 75 |
| 39 | 16.8076 | 21.2251 | 93 | 10 | 115 |
| 40 | .0000 | .0000 | 1 | 0 | 86 |
| 41 | 45.6798 | 34.3515 | 106 | 106 | 78 |
| 42 | 14.3911 | 16.2884 | 52 | 1 | 74 |
| 43 | 4.0455 | 5.5495 | 21 | 1 | 73 |
| 44 | 3.8920 | 5.3322 | 20 | 0 | 73 |
| 45 | 8.4580 | 17.6306 | 62 | 0 | 73 |
| 46 | 1.3461 | 3.8723 | 23 | 0 | 73 |
| 47 | 64.8416 | 19.8399 | 102 | 97 | 48 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | .5225 | .6822 | 3 | 1 | 31 |
| 49 | .2088 | .4522 | 2 | 1 | 12 |
| 50 | .7988 | .9833 | 3 | 0 | 6 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0548 | .2276 | 1 | 0 | 4 |
| 94 | .0000 | .0000 | 1 | 0 | 8 |
| 95 | .0000 | .0000 | 1 | 0 | 17 |
| 97 | .0959 | .2944 | 1 | 0 | 7 |
| 98 | .0795 | .2704 | 1 | 1 | 7 |
| 99 | .0384 | .1921 | 1 | 0 | 14 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.41 | 1.983 | 5 | 0 |
| 2 | LEECC | 6 | 3.29 | 2.047 | 6 | 5 |
| 3 | REQ | 6 | 3.65 | 2.693 | 6 | 0 |
| 4 | BDEE | 7 | 2.63 | 2.138 | 7 | 1 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 2.07 | 1.787 | 4 | 1 |
| 7 | MPROG | 5 | 1.93 | 1.765 | 5 | 0 |
| 8 | AFRCE | 9 | 4.37 | 2.863 | 9 | 3 |
| 9 | COE | 18 | 6.52 | 4.206 | 18 | 5 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.5936 | 0 | 5 |
| 2 | LEECC | 1 | 2.7051 | 0 | 6 |
| 3 | REQ | 6 | 2.3541 | 0 | 6 |
| 4 | BDEE | 6 | 4.3686 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 3 | 1.9333 | 0 | 4 |
| 7 | MPROG | 5 | 3.0690 | 0 | 5 |
| 8 | AFRCE | 6 | 4.6264 | 0 | 9 |
| 9 | COE | 13 | 11.4841 | 0 | 18 |

## **GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0219 |
| 8 | DI | CLOSED | .0959 |
| 9 | DISTR | CLOSED | .0822 |
| 10 | CORPS | OPEN | .0795 |
| 11 | REV30 | CLOSED | .0384 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .4226 |
| 14 | HOLD | OPEN | .9781 |
| 15 | HOLD1 | OPEN | .9781 |

## **HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                  +
 15  .319  .100E+01 +*****************                                 +
 11  .234  .200E+01 +*************                   C                 +
 21  .447  .300E+01 +***********************                           C
  0  .000  .400E+01 +                                                  C
  0  .000    INF    +                                                  C
---                 +    +    +    +    +    +    +    +    +    +    +
 47                 0         20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .213E+01 | .875E+00 | .411E+00 | .100E+01 | .300E+01 | 47 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 24  .511  .000E+00 +**************************                       +
  8  .170  .100E+01 +*********                        C               +
  4  .085  .200E+01 +****                                 C           +
 11  .234  .300E+01 +************                                     C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 47                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .104E+01 | .125E+01 | .120E+01 | .000E+00 | .300E+01 | 47 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 13  .867  .100E+01 +*******************************************      +
  0  .000  .200E+01 +                                          C      +
  2  .133  .300E+01 +*******                                          C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 15                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .127E+01 | .704E+00 | .556E+00 | .100E+01 | .300E+01 | 15 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  2  .133  .100E+01 +******                                           +
  5  .333  .200E+01 +****************      C                          +
  4  .267  .300E+01 +************                        C            +
  4  .267  .400E+01 +************                                     C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 15                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .214E+01 | .109E+01 | .511E+00 | .262E+00 | .391E+01 | 15 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  4  .125  .100E+01 +*****                                            +
 11  .344  .200E+01 +****************      C                          +
  9  .281  .300E+01 +*************                        C           +
  8  .250  .400E+01 +************                                     C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 32                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .207E+01 | .103E+01 | .498E+00 | .229E+00 | .387E+01 | 32 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE  8/16/1985                                RUN NUMBER  1 OF  1

CURRENT TIME   .3650E+04
STATISTICAL ARRAYS CLEARED   .3285E+04

END OF YEAR 10

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .193E+03 | .530E+02 | .274E+00 | .994E+02 | .292E+03 | 20 |
| DI OTHER AFRCES | .432E+03 | .122E+03 | .284E+00 | .125E+03 | .601E+03 | 233 |
| DI ISSUED | .252E+03 | .162E+02 | .645E-01 | .241E+03 | .276E+03 | 17 |
| DI FOR OTHER PRO | .430E+03 | .126E+03 | .293E+00 | .157E+03 | .601E+03 | 57 |
| TIME TO 30% | .532E+03 | .106E+03 | .199E+00 | .453E+03 | .855E+03 | 22 |
| OTHERS TO 30% | .650E+03 | .123E+03 | .189E+00 | .377E+03 | .838E+03 | 59 |
| CONG. DELAY | .757E+02 | .730E+01 | .963E-01 | .702E+02 | .850E+02 | 24 |
| TYPE PROJECT | .224E+01 | .839E+00 | .375E+00 | .100E+01 | .300E+01 | 51 |
| CONSTR. CHANGES | .902E+00 | .122E+01 | .135E+01 | .000E+00 | .300E+01 | 51 |
| TIME COMPLETE | .192E+04 | .223E+03 | .116E+00 | .164E+04 | .240E+04 | 13 |
| DELIVERY STATUS | .131E+01 | .751E+00 | .574E+00 | .100E+01 | .300E+01 | 13 |
| PRIORITY | .211E+01 | .117E+01 | .556E+00 | .547E-01 | .389E+01 | 13 |
| OTHERS COMPLETE | .195E+04 | .235E+03 | .121E+00 | .165E+04 | .288E+04 | 38 |
| PRIORITY OTHERS | .199E+01 | .113E+01 | .568E+00 | .233E-01 | .391E+01 | 38 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.808 | 4.970 | 14 | 0 | 69.495 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .023 | .149 | 1 | 0 | .414 |
| 4 | AWAIT | .480 | 1.087 | 5 | 0 | 8.764 |
| 5 | AWAIT | .009 | .096 | 1 | 0 | .170 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.353 | 81.767 | 251 | 251 | 158.763 |
| 9 | AWAIT | .050 | .300 | 2 | 0 | .914 |
| 10 | AWAIT | 69.083 | 52.943 | 172 | 43 | 102.919 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 12 | AWAIT | .319 | .466 | 1 | 0 | 14.535 |
| 13 | AWAIT | .000 | .018 | 1 | 0 | .040 |
| 14 | AWAIT | 5.213 | 28.131 | 251 | 0 | 4.201 |
| 15 | AWAIT | .004 | .061 | 1 | 0 | .691 |
| 16 | AWAIT | 5.168 | 11.325 | 47 | 1 | 26.198 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 11.704 | 25.768 | 117 | 0 | 13.916 |
| 19 | AWAIT | .213 | .409 | 1 | 0 | 12.950 |
| 20 | AWAIT | .003 | .050 | 1 | 0 | .153 |
| 21 | AWAIT | 18.084 | 24.625 | 96 | 0 | 21.500 |
| 22 | AWAIT | .896 | 2.192 | 8 | 0 | 10.897 |
| 23 | AWAIT | .304 | .460 | 1 | 0 | 18.521 |
| 24 | AWAIT | 3.258 | 4.764 | 26 | 0 | 16.071 |
| 25 | AWAIT | .007 | .084 | 1 | 0 | .520 |
| 26 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 27 | AWAIT | .000 | .012 | 1 | 0 | .018 |
| 28 | AWAIT | .130 | .752 | 9 | 0 | .632 |
| 29 | AWAIT | .004 | .059 | 1 | 0 | .092 |
| 30 | AWAIT | 2.154 | 1.628 | 6 | 3 | 9.471 |
| 31 | AWAIT | .882 | 1.474 | 4 | 0 | 22.993 |
| 32 | AWAIT | 1.197 | 1.739 | 4 | 0 | 31.199 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | 1.054 | 3.198 | 16 | 0 | 4.527 |
| 35 | AWAIT | 2.557 | 5.623 | 23 | 0 | 10.978 |
| 36 | AWAIT | .000 | .019 | 1 | 0 | .126 |
| 37 | AWAIT | 21.219 | 16.876 | 50 | 12 | 71.713 |
| 38 | AWAIT | .092 | .343 | 3 | 2 | .401 |
| 39 | AWAIT | .046 | .210 | 1 | 1 | .848 |
| 40 | AWAIT | .022 | .148 | 1 | 0 | 2.719 |
| 41 | AWAIT | 14.482 | 27.024 | 78 | 0 | 51.320 |
| 42 | AWAIT | 8.551 | 14.937 | 64 | 11 | 27.378 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.964 | 6.059 | 20 | 19 | 102.615 |
| 45 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 46 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 47 | AWAIT | .122 | .342 | 2 | 2 | 4.936 |
| 48 | AWAIT | 1.015 | 2.355 | 9 | 0 | 9.752 |
| 49 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 50 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 51 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 52 | AWAIT | .028 | .165 | 1 | 0 | .512 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .005 | .087 | 2 | 0 | .008 |
| 55 | CALENDAR | 470.016 | 131.565 | 873 | 401 | 9.935 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .4537 | .9603 | 4 | 0 | 20 |
| 4 | 2.2253 | 2.2842 | 6 | 0 | 20 |
| 5 | .3713 | .7401 | 3 | 0 | 20 |
| 6 | .9675 | 1.3364 | 5 | 0 | 20 |
| 7 | .4640 | .7925 | 3 | 0 | 20 |
| 8 | .7014 | .9243 | 3 | 0 | 20 |
| 9 | 2.4203 | 20.1210 | 251 | 0 | 453 |
| 10 | 3.7400 | 23.4221 | 251 | 0 | 453 |
| 11 | .0000 | .0000 | 1 | 0 | 288 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 219 |
| 14 | .0000 | .0000 | 1 | 0 | 69 |
| 15 | 7.2287 | 15.3967 | 47 | 0 | 71 |
| 16 | .0000 | .0000 | 1 | 0 | 67 |
| 17 | .0000 | .0000 | 1 | 0 | 4 |
| 18 | .1359 | .4685 | 2 | 0 | 4 |
| 19 | .0750 | .2965 | 2 | 0 | 4 |
| 20 | 4.0849 | 11.3942 | 47 | 0 | 71 |
| 21 | .4227 | .9532 | 5 | 0 | 307 |
| 22 | .0000 | .0000 | 1 | 0 | 233 |
| 23 | .0000 | .0000 | 1 | 0 | 44 |
| 24 | .0000 | .0000 | 1 | 0 | 30 |
| 25 | .5484 | 1.3446 | 6 | 0 | 30 |
| 26 | .9130 | 3.5483 | 31 | 0 | 75 |
| 27 | 2.8003 | 7.2760 | 35 | 7 | 82 |
| 28 | 9.2266 | 13.1610 | 47 | 11 | 93 |
| 29 | 1.7891 | 3.7388 | 20 | 14 | 84 |
| 30 | 14.0518 | 14.9388 | 45 | 33 | 72 |
| 31 | 19.6177 | 15.2733 | 49 | 5 | 81 |
| 32 | .0000 | .0000 | 1 | 0 | 22 |
| 33 | .5307 | 1.6310 | 7 | 0 | 80 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 80 |
| 36 | 10.0293 | 7.8036 | 29 | 0 | 90 |
| 37 | 2.2197 | 2.5254 | 10 | 0 | 85 |
| 38 | .8264 | 1.5297 | 16 | 0 | 85 |
| 39 | 14.2770 | 17.0984 | 55 | 22 | 84 |
| 40 | .0000 | .0000 | 1 | 0 | 56 |
| 41 | 43.0230 | 28.7380 | 110 | 71 | 116 |
| 42 | 21.7557 | 20.4391 | 65 | 0 | 114 |
| 43 | 6.2284 | 7.3953 | 31 | 0 | 115 |
| 44 | 6.3275 | 7.4117 | 31 | 3 | 112 |
| 45 | 11.7558 | 22.8220 | 79 | 0 | 103 |
| 46 | 1.9185 | 5.7393 | 42 | 0 | 103 |
| 47 | 84.4599 | 14.0519 | 147 | 147 | 51 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | .6297 | 1.4503 | 9 | 0 | 39 |
| 49 | .1218 | .3271 | 1 | 0 | 8 |
| 50 | .2877 | .6545 | 2 | 0 | 2 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0548 | .2276 | 1 | 0 | 4 |
| 94 | .0000 | .0000 | 1 | 0 | 6 |
| 95 | .0000 | .0000 | 1 | 0 | 19 |
| 97 | .0822 | .2747 | 1 | 0 | 6 |
| 98 | .0859 | .2802 | 1 | 1 | 8 |
| 99 | .0384 | .1921 | 1 | 0 | 14 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.49 | 2.035 | 5 | 0 |
| 2 | LEECC | 6 | 3.07 | 2.325 | 6 | 6 |
| 3 | REQ | 6 | 3.77 | 2.626 | 6 | 0 |
| 4 | BDEE | 7 | 2.91 | 1.977 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 2.43 | 1.530 | 4 | 0 |
| 7 | MPROG | 5 | 1.95 | 1.694 | 5 | 2 |
| 8 | AFRCE | 9 | 5.44 | 2.807 | 9 | 3 |
| 9 | COE | 18 | 9.76 | 5.762 | 18 | 5 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.5133 | 0 | 5 |
| 2 | LEECC | 0 | 2.9303 | 0 | 6 |
| 3 | REQ | 6 | 2.2305 | 0 | 6 |
| 4 | BDEE | 7 | 4.0891 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 4 | 1.5708 | 0 | 4 |
| 7 | MPROG | 3 | 3.0466 | 0 | 5 |
| 8 | AFRCE | 6 | 3.5605 | 0 | 8 |
| 9 | COE | 13 | 8.2398 | 0 | 17 |

## **GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0219 |
| 8 | DI | CLOSED | .0822 |
| 9 | DISTR | CLOSED | .0548 |
| 10 | CORPS | OPEN | .0859 |
| 11 | REV30 | CLOSED | .0384 |
| 12 | CALL2 | CLOSED | .2469 |
| 13 | DI100 | CLOSED | .3867 |
| 14 | HOLD | OPEN | .9781 |
| 15 | HOLD1 | OPEN | .9781 |

## **HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 13  .255  .100E+01 +*************                                    +
 13  .255  .200E+01 +*************           C                        +
 25  .490  .300E+01 +*************************                        C
  0  .000  .400E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 51                 0         20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .224E+01 | .839E+00 | .375E+00 | .100E+01 | .300E+01 | 51 |

## **HISTOGRAM NUMBER 10**

### CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80      100
                    +    +    +    +    +    +    +    +    +    +    +
 31  .608  .000E+00 +******************************                   +
  3  .059  .100E+01 +***                             C                +
  8  .157  .200E+01 +********                                C        +
  9  .176  .300E+01 +*********                                        C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 51                 0         20        40        60        80      100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .902E+00 | .122E+01 | .135E+01 | .000E+00 | .300E+01 | 51 |

## **HISTOGRAM NUMBER 12**

### DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80      100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 11  .846  .100E+01 +******************************************       +
  0  .000  .200E+01 +                                         C       +
  2  .154  .300E+01 +********                                         C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 13                 0         20        40        60        80      100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .131E+01 | .751E+00 | .574E+00 | .100E+01 | .300E+01 | 13 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  2  .154  .100E+01 +********                                         +
  5  .385  .200E+01 +*******************       C                      +
  2  .154  .300E+01 +********                          C              +
  4  .308  .400E+01 +***************                                  C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 13                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .211E+01 | .117E+01 | .556E+00 | .547E-01 | .389E+01 | 13 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  9  .237  .100E+01 +************                                     +
 10  .263  .200E+01 +*************           C                        +
 10  .263  .300E+01 +*************                        C           +
  9  .237  .400E+01 +************                                     C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 38                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .199E+01 | .113E+01 | .568E+00 | .233E-01 | .391E+01 | 38 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL        BY BLAKE & MARCHBANKS

DATE 8/16/1985        RUN NUMBER  1 OF  1

CURRENT TIME .4015E+04
STATISTICAL ARRAYS CLEARED AT TIME .3650E+04

END OF YEAR 11

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .195E+03 | .618E+02 | .317E+00 | .906E+02 | .311E+03 | 20 |
| DI OTHER AFRCES | .453E+03 | .120E+03 | .264E+00 | .128E+03 | .634E+03 | 207 |
| DI ISSUED | .326E+03 | .131E+03 | .401E+00 | .274E+03 | .639E+03 | 21 |
| DI FOR OTHER PRO | .450E+03 | .141E+03 | .313E+00 | .114E+03 | .634E+03 | 47 |
| TIME TO 30% | .499E+03 | .297E+02 | .595E-01 | .421E+03 | .545E+03 | 17 |
| OTHERS TO 30% | .690E+03 | .141E+03 | .205E+00 | .408E+03 | .883E+03 | 56 |
| CONG. DELAY | .788E+02 | .534E+01 | .678E-01 | .744E+02 | .961E+02 | 16 |
| TYPE PROJECT | .197E+01 | .789E+00 | .401E+00 | .100E+01 | .300E+01 | 62 |
| CONSTR. CHANGES | .742E+00 | .119E+01 | .160E+01 | .000E+00 | .400E+01 | 62 |
| TIME COMPLETE | .192E+04 | .227E+03 | .118E+00 | .136E+04 | .233E+04 | 20 |
| DELIVERY STATUS | .140E+01 | .821E+00 | .586E+00 | .100E+01 | .300E+01 | 20 |
| PRIORITY | .204E+01 | .136E+01 | .668E+00 | .136E+00 | .372E+01 | 20 |
| OTHERS COMPLETE | .200E+04 | .213E+03 | .106E+00 | .141E+04 | .247E+04 | 42 |
| PRIORITY OTHERS | .204E+01 | .103E+01 | .503E+00 | .156E+00 | .397E+01 | 42 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.826 | 5.016 | 14 | 0 | 69.816 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .059 | .304 | 2 | 0 | 1.071 |
| 4 | AWAIT | .726 | 1.524 | 5 | 0 | 13.253 |
| 5 | AWAIT | .032 | .179 | 2 | 0 | .584 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.266 | 81.923 | 251 | 251 | 158.700 |
| 9 | AWAIT | .073 | .430 | 3 | 0 | 1.334 |
| 10 | AWAIT | 69.363 | 51.883 | 164 | 36 | 105.051 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 12 | AWAIT | .402 | .490 | 1 | 0 | 36.662 |
| 13 | AWAIT | .001 | .023 | 1 | 0 | .063 |
| 14 | AWAIT | 20.603 | 57.294 | 251 | 0 | 16.491 |
| 15 | AWAIT | .001 | .029 | 1 | 0 | .153 |
| 16 | AWAIT | 4.198 | 10.654 | 43 | 2 | 21.889 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 8.337 | 23.146 | 116 | 0 | 10.602 |
| 19 | AWAIT | .255 | .436 | 1 | 0 | 23.239 |
| 20 | AWAIT | .027 | .163 | 1 | 0 | 2.479 |
| 21 | AWAIT | 20.925 | 31.115 | 144 | 12 | 26.612 |
| 22 | AWAIT | 1.703 | 3.278 | 9 | 0 | 18.835 |
| 23 | AWAIT | .392 | .488 | 1 | 0 | 35.769 |
| 24 | AWAIT | 4.254 | 6.079 | 43 | 0 | 22.834 |
| 25 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 26 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 27 | AWAIT | .003 | .054 | 1 | 0 | .359 |
| 28 | AWAIT | .146 | .865 | 17 | 0 | .786 |
| 29 | AWAIT | .008 | .087 | 1 | 0 | .214 |
| 30 | AWAIT | 1.473 | 1.440 | 7 | 3 | 7.073 |
| 31 | AWAIT | 1.711 | 2.382 | 6 | 0 | 48.033 |
| 32 | AWAIT | 1.029 | 1.376 | 3 | 0 | 28.880 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | 5.340 | 11.466 | 41 | 0 | 24.987 |
| 35 | AWAIT | 4.536 | 7.541 | 19 | 0 | 21.224 |
| 36 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 37 | AWAIT | 18.741 | 18.761 | 67 | 67 | 76.007 |
| 38 | AWAIT | .055 | .275 | 2 | 0 | .453 |
| 39 | AWAIT | .015 | .122 | 1 | 0 | .252 |
| 40 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 41 | AWAIT | 18.132 | 26.400 | 68 | 0 | 82.728 |
| 42 | AWAIT | 12.510 | 11.331 | 46 | 11 | 50.176 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.518 | 6.185 | 20 | 19 | 98.436 |
| 45 | AWAIT | .289 | .657 | 2 | 0 | 13.197 |
| 46 | AWAIT | .356 | .479 | 1 | 0 | 16.256 |
| 47 | AWAIT | .031 | .202 | 2 | 0 | 1.134 |
| 48 | AWAIT | 2.176 | 3.457 | 10 | 0 | 18.473 |
| 49 | AWAIT | .000 | .015 | 1 | 0 | .017 |
| 50 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 51 | AWAIT | .008 | .087 | 1 | 0 | .696 |
| 52 | AWAIT | .030 | .176 | 2 | 0 | .540 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .012 | .135 | 2 | 0 | .022 |
| 55 | CALENDAR | 458.495 | 147.762 | 896 | 354 | 10.434 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .5697 | 1.1394 | 5 | 0 | 20 |
| 4 | 2.2084 | 2.3609 | 6 | 0 | 20 |
| 5 | .3385 | .6733 | 3 | 0 | 20 |
| 6 | .9897 | 1.3744 | 5 | 0 | 20 |
| 7 | .2876 | .6098 | 3 | 0 | 20 |
| 8 | .6826 | 1.0554 | 4 | 0 | 20 |
| 9 | 2.4565 | 19.9692 | 251 | 0 | 456 |
| 10 | 3.7721 | 23.1650 | 251 | 0 | 456 |
| 11 | .0000 | .0000 | 1 | 0 | 268 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 199 |
| 14 | .0000 | .0000 | 1 | 0 | 69 |
| 15 | 7.1639 | 14.9088 | 43 | 0 | 68 |
| 16 | .0000 | .0000 | 1 | 0 | 64 |
| 17 | .0000 | .0000 | 1 | 0 | 4 |
| 18 | .1208 | .4607 | 3 | 0 | 4 |
| 19 | .0612 | .2566 | 2 | 0 | 4 |
| 20 | 3.9060 | 10.8232 | 42 | 1 | 67 |
| 21 | .3824 | .9998 | 5 | 0 | 287 |
| 22 | .0000 | .0000 | 1 | 0 | 207 |
| 23 | .0000 | .0000 | 1 | 0 | 35 |
| 24 | .0000 | .0000 | 1 | 0 | 33 |
| 25 | .5675 | 1.4734 | 6 | 0 | 33 |
| 26 | .8533 | 4.8975 | 45 | 0 | 68 |
| 27 | 2.4935 | 8.2071 | 46 | 3 | 72 |
| 28 | 5.8969 | 13.3105 | 58 | 41 | 42 |
| 29 | 1.4138 | 2.7983 | 17 | 17 | 39 |
| 30 | 12.7556 | 16.9768 | 51 | 0 | 72 |
| 31 | 18.2827 | 18.4227 | 54 | 4 | 73 |
| 32 | .0000 | .0000 | 1 | 0 | 17 |
| 33 | .8048 | 2.3418 | 15 | 0 | 73 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 73 |
| 36 | 8.1851 | 9.3080 | 35 | 0 | 73 |
| 37 | 2.3226 | 3.0665 | 14 | 0 | 78 |
| 38 | .7255 | 2.3200 | 16 | 0 | 78 |
| 39 | 9.6448 | 6.5003 | 24 | 3 | 42 |
| 40 | .0000 | .0000 | 1 | 0 | 29 |
| 41 | 31.1876 | 20.7744 | 78 | 19 | 93 |
| 42 | 16.9109 | 10.2716 | 36 | 1 | 88 |
| 43 | 4.6786 | 4.0547 | 18 | 3 | 85 |
| 44 | 4.3967 | 4.1356 | 16 | 6 | 80 |
| 45 | 7.8823 | 19.0747 | 68 | 63 | 17 |
| 46 | .2590 | .8694 | 5 | 5 | 12 |
| 47 | 119.3132 | 16.8524 | 149 | 95 | 66 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | .7051 | 1.5222 | 10 | 0 | 43 |
| 49 | .1613 | .4611 | 3 | 1 | 9 |
| 50 | .0577 | .3755 | 3 | 3 | 0 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0548 | .2276 | 1 | 0 | 4 |
| 94 | .0000 | .0000 | 1 | 0 | 4 |
| 95 | .0000 | .0000 | 1 | 0 | 22 |
| 97 | .0548 | .2276 | 1 | 0 | 4 |
| 98 | .0436 | .2043 | 1 | 1 | 4 |
| 99 | .0356 | .1853 | 1 | 0 | 13 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.34 | 1.871 | 5 | 0 |
| 2 | LEECC | 6 | 3.03 | 1.529 | 6 | 6 |
| 3 | REQ | 6 | 3.74 | 2.657 | 6 | 0 |
| 4 | BDEE | 7 | 2.54 | 2.222 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 1.94 | 1.830 | 4 | 0 |
| 7 | MPROG | 5 | 1.84 | 1.905 | 5 | 0 |
| 8 | AFRCE | 9 | 5.04 | 3.762 | 9 | 2 |
| 9 | COE | 18 | 10.03 | 7.244 | 18 | 5 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.6578 | 0 | 5 |
| 2 | LEECC | 0 | 2.9689 | 0 | 6 |
| 3 | REQ | 6 | 2.2642 | 0 | 6 |
| 4 | BDEE | 7 | 4.4610 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 4 | 2.0603 | 0 | 4 |
| 7 | MPROG | 5 | 3.1634 | 0 | 5 |
| 8 | AFRCE | 7 | 3.9623 | 0 | 9 |
| 9 | COE | 13 | 7.9674 | 0 | 18 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CON628 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0219 |
| 8 | DI | CLOSED | .0548 |
| 9 | DISTR | CLOSED | .0137 |
| 10 | CORPS | OPEN | .0436 |
| 11 | REV30 | CLOSED | .0356 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .4095 |
| 14 | HOLD | OPEN | .9781 |
| 15 | HOLD1 | OPEN | .9781 |

**HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ   CELL LIM 0         20        40        60        80        100
                     +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00  +                                                  +
 20  .323  .100E+01  +****************                                  +
 24  .387  .200E+01  +*******************               C               +
 18  .290  .300E+01  +***************                                   C
  0  .000  .400E+01  +                                                  C
  0  .000    INF     +                                                  C
---                  +    +    +    +    +    +    +    +    +    +    +
 62                  0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .197E+01 | .789E+00 | .401E+00 | .100E+01 | .300E+01 | 62 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 41  .661  .000E+00 +*********************************                +
  7  .113  .100E+01 +******                                C          +
  4  .065  .200E+01 +***                                      C       +
  9  .145  .300E+01 +*******                                         C+
  1  .016    INF    +*                                                C
---                 +    +    +    +    +    +    +    +    +    +    +
 62                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .742E+00 | .119E+01 | .160E+01 | .000E+00 | .400E+01 | 62 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 16  .800  .100E+01 +****************************************         +
  0  .000  .200E+01 +                                       C         +
  4  .200  .300E+01 +**********                                       C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 20                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .140E+01 | .821E+00 | .586E+00 | .100E+01 | .300E+01 | 20 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  7  .350  .100E+01 ******************                                +
  2  .100  .200E+01 ******                      C                     +
  3  .150  .300E+01 ********                           C              +
  8  .400  .400E+01 ********************                              C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 20                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .204E+01 | .136E+01 | .668E+00 | .136E+00 | .372E+01 | 20 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  6  .143  .100E+01 ********                                          +
 16  .381  .200E+01 ********************      C                       +
 12  .286  .300E+01 ***************                         C         +
  8  .190  .400E+01 ***********                                       C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 42                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .204E+01 | .103E+01 | .503E+00 | .156E+00 | .397E+01 | 42 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL        BY BLAKE & MARCHBANKS

DATE 8/16/1985        RUN NUMBER 1 OF 1

CURRENT TIME .4380E+04
STATISTICAL ARRAYS CLEARED AT TIME .4015E+04

END OF YEAR 12

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .197E+03 | .595E+02 | .302E+00 | .127E+03 | .303E+03 | 20 |
| DI OTHER AFRCES | .437E+03 | .118E+03 | .271E+00 | .123E+03 | .605E+03 | 216 |
| DI ISSUED | .328E+03 | .122E+03 | .371E+00 | .268E+03 | .661E+03 | 18 |
| DI FOR OTHER PRO | .451E+03 | .119E+03 | .265E+00 | .152E+03 | .605E+03 | 61 |
| TIME TO 30% | .561E+03 | .132E+03 | .236E+00 | .446E+03 | .884E+03 | 21 |
| OTHERS TO 30% | .704E+03 | .162E+03 | .231E+00 | .315E+03 | .902E+03 | 56 |
| CONG. DELAY | .774E+02 | .975E+01 | .126E+00 | .661E+02 | .854E+02 | 17 |
| TYPE PROJECT | .221E+01 | .824E+00 | .373E+00 | .100E+01 | .300E+01 | 95 |
| CONSTR. CHANGES | .789E+00 | .118E+01 | .150E+01 | .000E+00 | .400E+01 | 95 |
| TIME COMPLETE | .189E+04 | .237E+03 | .125E+00 | .144E+04 | .241E+04 | 24 |
| DELIVERY STATUS | .142E+01 | .830E+00 | .586E+00 | .100E+01 | .300E+01 | 24 |
| PRIORITY | .189E+01 | .144E+01 | .759E+00 | .599E-01 | .392E+01 | 24 |
| OTHERS COMPLETE | .203E+04 | .304E+03 | .150E+00 | .129E+04 | .278E+04 | 71 |
| PRIORITY OTHERS | .201E+01 | .106E+01 | .527E+00 | .200E-01 | .397E+01 | 71 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.875 | 5.063 | 14 | 0 | 70.711 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .128 | .433 | 2 | 0 | 2.341 |
| 4 | AWAIT | .460 | 1.254 | 6 | 0 | 8.401 |
| 5 | AWAIT | .034 | .193 | 2 | 0 | .612 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.238 | 81.892 | 251 | 251 | 158.679 |
| 9 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 10 | AWAIT | 66.701 | 52.932 | 163 | 28 | 103.599 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 12 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 13 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 14 | AWAIT | 32.480 | 70.622 | 251 | 0 | 25.885 |
| 15 | AWAIT | .001 | .023 | 1 | 0 | .094 |
| 16 | AWAIT | 5.565 | 13.290 | 49 | 0 | 24.475 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 5.898 | 19.815 | 118 | 0 | 7.607 |
| 19 | AWAIT | .188 | .391 | 1 | 0 | 11.457 |
| 20 | AWAIT | .003 | .052 | 1 | 0 | .163 |
| 21 | AWAIT | 17.153 | 25.941 | 87 | 0 | 21.223 |
| 22 | AWAIT | .315 | .899 | 6 | 0 | 3.593 |
| 23 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 24 | AWAIT | .952 | 2.821 | 20 | 0 | 4.400 |
| 25 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 26 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 27 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 28 | AWAIT | .161 | .819 | 9 | 0 | .743 |
| 29 | AWAIT | .000 | .017 | 1 | 0 | .008 |
| 30 | AWAIT | 1.778 | 1.817 | 8 | 1 | 8.112 |
| 31 | AWAIT | .417 | .799 | 2 | 0 | 11.695 |
| 32 | AWAIT | .755 | 1.501 | 4 | 0 | 21.195 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | .020 | .164 | 2 | 0 | .107 |
| 35 | AWAIT | 1.999 | 5.677 | 33 | 0 | 10.576 |
| 36 | AWAIT | .001 | .035 | 1 | 0 | .438 |
| 37 | AWAIT | 42.667 | 32.545 | 74 | 14 | 114.512 |
| 38 | AWAIT | .146 | .626 | 6 | 0 | .522 |
| 39 | AWAIT | .050 | .217 | 1 | 0 | 1.208 |
| 40 | AWAIT | .066 | .248 | 1 | 0 | 4.795 |
| 41 | AWAIT | .397 | 2.555 | 27 | 0 | 3.711 |
| 42 | AWAIT | 13.189 | 10.839 | 31 | 5 | 109.407 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.910 | 6.067 | 20 | 19 | 102.103 |
| 45 | AWAIT | .063 | .348 | 2 | 0 | 2.316 |
| 46 | AWAIT | .452 | 1.002 | 3 | 0 | 18.313 |
| 47 | AWAIT | .151 | .381 | 2 | 0 | 6.119 |
| 48 | AWAIT | .070 | .349 | 3 | 0 | .472 |
| 49 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 50 | AWAIT | .089 | .409 | 2 | 0 | 4.658 |
| 51 | AWAIT | .367 | .793 | 3 | 0 | 16.751 |
| 52 | AWAIT | .234 | .815 | 4 | 0 | 4.266 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 55 | CALENDAR | 453.934 | 104.149 | 819 | 430 | 10.025 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .4789 | 1.0617 | 5 | 0 | 20 |
| 4 | 2.3689 | 2.3796 | 6 | 0 | 20 |
| 5 | .3204 | .6965 | 4 | 0 | 20 |
| 6 | .9907 | 1.3363 | 6 | 0 | 20 |
| 7 | .2915 | .5559 | 3 | 0 | 20 |
| 8 | .6618 | 1.0483 | 5 | 0 | 20 |
| 9 | 2.4501 | 19.7979 | 251 | 0 | 458 |
| 10 | 3.7510 | 23.0182 | 251 | 0 | 458 |
| 11 | .0000 | .0000 | 1 | 0 | 296 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 215 |
| 14 | .0000 | .0000 | 1 | 0 | 81 |
| 15 | 7.5894 | 16.8574 | 49 | 0 | 83 |
| 16 | .0000 | .0000 | 1 | 0 | 78 |
| 17 | .0000 | .0000 | 1 | 0 | 5 |
| 18 | .1414 | .5347 | 4 | 1 | 4 |
| 19 | .0659 | .3060 | 2 | 0 | 4 |
| 20 | 4.1151 | 12.2273 | 48 | 33 | 50 |
| 21 | .3994 | 1.0719 | 4 | 0 | 283 |
| 22 | .0000 | .0000 | 1 | 0 | 216 |
| 23 | .0000 | .0000 | 1 | 0 | 47 |
| 24 | .0000 | .0000 | 1 | 0 | 32 |
| 25 | .5894 | 1.3445 | 6 | 0 | 32 |
| 26 | .9673 | 3.2211 | 23 | 0 | 79 |
| 27 | 2.7036 | 5.9335 | 25 | 25 | 57 |
| 28 | 7.5912 | 8.5410 | 43 | 13 | 85 |
| 29 | 2.2967 | 5.4044 | 33 | 4 | 98 |
| 30 | 18.9631 | 19.1863 | 61 | 7 | 91 |
| 31 | 20.2512 | 19.6533 | 61 | 18 | 77 |
| 32 | .0000 | .0000 | 1 | 0 | 21 |
| 33 | .7159 | 1.9968 | 13 | 0 | 79 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 79 |
| 36 | 8.5010 | 12.5203 | 51 | 10 | 69 |
| 37 | 1.8358 | 3.5202 | 15 | 0 | 69 |
| 38 | .6575 | 1.4478 | 9 | 0 | 69 |
| 39 | 17.4233 | 21.7337 | 74 | 23 | 102 |
| 40 | .0000 | .0000 | 1 | 0 | 66 |
| 41 | 29.1884 | 27.4242 | 92 | 92 | 22 |
| 42 | 4.0802 | 3.1963 | 10 | 0 | 22 |
| 43 | 1.3026 | 1.3990 | 5 | 0 | 25 |
| 44 | 1.6885 | 1.4978 | 7 | 0 | 33 |
| 45 | 6.1253 | 11.8878 | 63 | 0 | 102 |
| 46 | 2.0669 | 5.5592 | 32 | 0 | 107 |
| 47 | 117.6038 | 15.7432 | 150 | 107 | 95 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | .8857 | .9941 | 4 | 0 | 54 |
| 49 | .1519 | .3985 | 2 | 0 | 10 |
| 50 | 1.0879 | 1.4423 | 5 | 3 | 7 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0274 | .1632 | 1 | 0 | 2 |
| 94 | .0000 | .0000 | 1 | 0 | 6 |
| 95 | .0000 | .0000 | 1 | 0 | 15 |
| 97 | .1233 | .3288 | 1 | 0 | 9 |
| 98 | .1031 | .3040 | 1 | 0 | 10 |
| 99 | .0356 | .1853 | 1 | 0 | 13 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.34 | 1.785 | 5 | 0 |
| 2 | LEECC | 6 | 2.72 | 2.394 | 6 | 6 |
| 3 | REQ | 6 | 3.96 | 2.444 | 6 | 0 |
| 4 | BDEE | 7 | 1.71 | 1.957 | 7 | 1 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 1.00 | 1.226 | 4 | 1 |
| 7 | MPROG | 5 | 1.90 | 1.830 | 5 | 0 |
| 8 | AFRCE | 9 | 4.07 | 3.335 | 9 | 3 |
| 9 | COE | 18 | 7.12 | 5.312 | 18 | 8 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.6553 | 0 | 5 |
| 2 | LEECC | 0 | 3.2765 | 0 | 6 |
| 3 | REQ | 6 | 2.0376 | 0 | 6 |
| 4 | BDEE | 6 | 5.2897 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 3 | 3.0023 | 0 | 4 |
| 7 | MPROG | 5 | 3.0992 | 0 | 5 |
| 8 | AFRCE | 6 | 4.9323 | 0 | 9 |
| 9 | COE | 10 | 10.8796 | 0 | 18 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0110 |
| 8 | DI | CLOSED | .1233 |
| 9 | DISTR | CLOSED | .0685 |
| 10 | CORPS | CLOSED | .1031 |
| 11 | REV30 | CLOSED | .0356 |
| 12 | CALL2 | CLOSED | .2478 |
| 13 | DI100 | CLOSED | .3658 |
| 14 | HOLD | OPEN | .9890 |
| 15 | HOLD1 | OPEN | .9890 |

**HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 24  .253  .100E+01 +**************                                   +
 27  .284  .200E+01 +***************                C                 +
 44  .463  .300E+01 +************************                         C
  0  .000  .400E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 95                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .221E+01 | .824E+00 | .373E+00 | .100E+01 | .300E+01 | 95 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
 OBS  RELA   UPPER
FREQ  FREQ  CELL LIM 0         20        40        60        80        100
                     +    +    +    +    +    +    +    +    +    +    +
  60  .632  .000E+00 +********************************                 +
  12  .126  .100E+01 +******                               C           +
   7  .074  .200E+01 +****                                     C       +
  15  .158  .300E+01 +********                                        C+
   1  .011    INF    +*                                                C
 ---                 +    +    +    +    +    +    +    +    +    +    +
  95                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .789E+00 | .118E+01 | .150E+01 | .000E+00 | .400E+01 | 95 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
 OBS  RELA   UPPER
FREQ  FREQ  CELL LIM 0         20        40        60        80        100
                     +    +    +    +    +    +    +    +    +    +    +
   0  .000  .000E+00 +                                                 +
  19  .792  .100E+01 +****************************************         +
   0  .000  .200E+01 +                                       C         +
   5  .208  .300E+01 +**********                                       C
   0  .000    INF    +                                                 C
 ---                 +    +    +    +    +    +    +    +    +    +    +
  24                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .142E+01 | .830E+00 | .586E+00 | .100E+01 | .300E+01 | 24 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20         40         60         80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                   +
  9  .375  .100E+01 +******************                                 +
  5  .208  .200E+01 +**********                  C                      +
  1  .042  .300E+01 +**                            C                    +
  9  .375  .400E+01 +******************                                 C
  0  .000    INF    +                                                   C
---                 +    +    +    +    +    +    +    +    +    +    +
 24                 0         20         40         60         80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .189E+01 | .144E+01 | .759E+00 | .599E-01 | .392E+01 | 24 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20         40         60         80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                   +
 11  .155  .100E+01 +********                                           +
 27  .380  .200E+01 +******************        C                        +
 20  .282  .300E+01 +**************                          C          +
 13  .183  .400E+01 +*********                                          C
  0  .000    INF    +                                                   C
---                 +    +    +    +    +    +    +    +    +    +    +
 71                 0         20         40         60         80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .201E+01 | .106E+01 | .527E+00 | .200E-01 | .397E+01 | 71 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL    BY BLAKE & MARCHBANKS

DATE 8/16/1985    RUN NUMBER 1 OF 1

CURRENT TIME .4745E+04
STATISTICAL ARRAYS CLEARED AT TIME .4380E+04

END OF YEAR 13

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .199E+03 | .544E+02 | .274E+00 | .123E+03 | .299E+03 | 20 |
| DI OTHER AFRCES | .434E+03 | .993E+02 | .229E+00 | .135E+03 | .603E+03 | 242 |
| DI ISSUED | .358E+03 | .148E+03 | .414E+00 | .266E+03 | .656E+03 | 21 |
| DI FOR OTHER PRO | .404E+03 | .120E+03 | .297E+00 | .143E+03 | .531E+03 | 57 |
| TIME TO 30% | .565E+03 | .127E+03 | .225E+00 | .472E+03 | .915E+03 | 18 |
| OTHERS TO 30% | .685E+03 | .132E+03 | .193E+00 | .362E+03 | .900E+03 | 57 |
| CONG. DELAY | .785E+02 | .111E+02 | .142E+00 | .657E+02 | .109E+03 | 18 |
| TYPE PROJECT | .209E+01 | .825E+00 | .395E+00 | .100E+01 | .300E+01 | 78 |
| CONSTR. CHANGES | .103E+01 | .140E+01 | .136E+01 | .000E+00 | .600E+01 | 78 |
| TIME COMPLETE | .182E+04 | .270E+03 | .148E+00 | .143E+04 | .246E+04 | 23 |
| DELIVERY STATUS | .126E+01 | .689E+00 | .546E+00 | .100E+01 | .300E+01 | 23 |
| PRIORITY | .192E+01 | .142E+01 | .740E+00 | .238E+00 | .390E+01 | 23 |
| OTHERS COMPLETE | .200E+04 | .249E+03 | .125E+00 | .138E+04 | .259E+04 | 55 |
| PRIORITY OTHERS | .207E+01 | .119E+01 | .577E+00 | .908E-01 | .395E+01 | 55 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.961 | 5.028 | 14 | 0 | 72.294 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .143 | .494 | 2 | 0 | 2.610 |
| 4 | AWAIT | .398 | 1.087 | 5 | 0 | 7.256 |
| 5 | AWAIT | .041 | .237 | 2 | 0 | .748 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.610 | 81.531 | 251 | 251 | 158.949 |
| 9 | AWAIT | .060 | .318 | 2 | 0 | 1.091 |
| 10 | AWAIT | 61.701 | 50.343 | 165 | 26 | 97.917 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 12 | AWAIT | .217 | .468 | 3 | 0 | 8.791 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 13 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 14 | AWAIT | 31.511 | 69.207 | 251 | 0 | 25.278 |
| 15 | AWAIT | .001 | .027 | 1 | 0 | .134 |
| 16 | AWAIT | 3.867 | 10.824 | 40 | 0 | 21.066 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 6.000 | 20.806 | 126 | 0 | 6.843 |
| 19 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 20 | AWAIT | .024 | .154 | 1 | 0 | 1.270 |
| 21 | AWAIT | 15.416 | 34.246 | 125 | 0 | 17.583 |
| 22 | AWAIT | 1.323 | 2.733 | 10 | 0 | 14.199 |
| 23 | AWAIT | .009 | .094 | 1 | 0 | .404 |
| 24 | AWAIT | .639 | 2.040 | 24 | 0 | 2.992 |
| 25 | AWAIT | .030 | .170 | 1 | 0 | 2.168 |
| 26 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 27 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 28 | AWAIT | .146 | .624 | 6 | 0 | .681 |
| 29 | AWAIT | .000 | .010 | 1 | 0 | .003 |
| 30 | AWAIT | 1.986 | 1.548 | 5 | 2 | 9.537 |
| 31 | AWAIT | .052 | .221 | 1 | 0 | 1.347 |
| 32 | AWAIT | .945 | 1.757 | 5 | 0 | 24.645 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | .003 | .056 | 1 | 0 | .015 |
| 35 | AWAIT | 1.152 | 3.176 | 19 | 0 | 5.321 |
| 36 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 37 | AWAIT | 17.998 | 13.920 | 41 | 20 | 70.637 |
| 38 | AWAIT | .113 | .477 | 4 | 0 | .515 |
| 39 | AWAIT | .032 | .176 | 1 | 0 | .488 |
| 40 | AWAIT | .006 | .080 | 1 | 0 | .789 |
| 41 | AWAIT | .706 | 4.402 | 43 | 0 | 2.865 |
| 42 | AWAIT | 8.629 | 10.580 | 49 | 18 | 29.163 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.463 | 6.189 | 20 | 19 | 97.923 |
| 45 | AWAIT | .028 | .166 | 1 | 0 | .574 |
| 46 | AWAIT | .272 | .600 | 2 | 0 | 5.232 |
| 47 | AWAIT | .049 | .225 | 2 | 0 | .940 |
| 48 | AWAIT | .034 | .193 | 2 | 0 | .271 |
| 49 | AWAIT | .005 | .068 | 1 | 0 | .426 |
| 50 | AWAIT | .019 | .137 | 1 | 0 | 1.747 |
| 51 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 52 | AWAIT | .200 | .726 | 4 | 0 | 3.653 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 55 | CALENDAR | 470.298 | 121.147 | 862 | 393 | 9.720 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .5428 | 1.0352 | 4 | 0 | 20 |
| 4 | 2.1231 | 2.1878 | 6 | 0 | 20 |
| 5 | .3911 | .7022 | 3 | 0 | 20 |
| 6 | .9784 | 1.2309 | 5 | 0 | 20 |
| 7 | .3884 | .6711 | 4 | 0 | 20 |
| 8 | .6879 | .9924 | 4 | 0 | 20 |
| 9 | 2.5620 | 20.5804 | 251 | 0 | 455 |
| 10 | 3.7287 | 23.2374 | 251 | 0 | 455 |
| 11 | .0000 | .0000 | 1 | 0 | 292 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 225 |
| 14 | .0000 | .0000 | 1 | 0 | 67 |
| 15 | 6.4049 | 13.6225 | 40 | 0 | 67 |
| 16 | .0000 | .0000 | 1 | 0 | 67 |
| 17 | .0000 | .0000 | 0 | 0 | 0 |
| 18 | .0018 | .0429 | 1 | 0 | 1 |
| 19 | .0244 | .1544 | 1 | 0 | 1 |
| 20 | 3.3944 | 10.5926 | 40 | 27 | 74 |
| 21 | .4195 | 1.1770 | 5 | 0 | 320 |
| 22 | .0000 | .0000 | 1 | 0 | 242 |
| 23 | .0000 | .0000 | 1 | 0 | 44 |
| 24 | .0000 | .0000 | 1 | 0 | 34 |
| 25 | .5859 | 1.4041 | 6 | 0 | 34 |
| 26 | .9909 | 3.4279 | 24 | 0 | 78 |
| 27 | 2.8826 | 6.3583 | 35 | 15 | 88 |
| 28 | 8.1071 | 8.7754 | 35 | 27 | 74 |
| 29 | .8476 | 1.4628 | 6 | 0 | 78 |
| 30 | 16.1252 | 11.1199 | 42 | 5 | 80 |
| 31 | 18.3994 | 11.8592 | 43 | 23 | 75 |
| 32 | .0000 | .0000 | 1 | 0 | 18 |
| 33 | .7738 | 1.9214 | 10 | 0 | 74 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 74 |
| 36 | 8.8471 | 6.9076 | 28 | 0 | 84 |
| 37 | 2.1702 | 2.2685 | 9 | 4 | 79 |
| 38 | .7729 | 1.0351 | 5 | 0 | 79 |
| 39 | 15.1636 | 12.3794 | 42 | 16 | 80 |
| 40 | .0000 | .0000 | 1 | 0 | 61 |
| 41 | 44.3633 | 25.5907 | 101 | 55 | 113 |
| 42 | 20.6342 | 15.9320 | 49 | 2 | 106 |
| 43 | 5.7803 | 5.4241 | 19 | 0 | 106 |
| 44 | 5.7092 | 5.6832 | 19 | 0 | 103 |
| 45 | 10.3540 | 18.2834 | 63 | 0 | 90 |
| 46 | 1.7229 | 4.3371 | 25 | 0 | 90 |
| 47 | 89.4300 | 18.6364 | 125 | 124 | 73 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | .7392 | .8595 | 4 | 1 | 45 |
| 49 | .3065 | .5599 | 2 | 0 | 19 |
| 50 | 1.1119 | 1.4468 | 5 | 0 | 9 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0274 | .1632 | 1 | 0 | 2 |
| 94 | .0000 | .0000 | 1 | 0 | 7 |
| 95 | .0000 | .0000 | 1 | 0 | 24 |
| 97 | .1096 | .3124 | 1 | 0 | 8 |
| 98 | .0986 | .2982 | 1 | 0 | 9 |
| 99 | .0384 | .1921 | 1 | 0 | 14 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.32 | 1.757 | 5 | 0 |
| 2 | LEECC | 6 | 3.80 | 1.811 | 6 | 4 |
| 3 | REQ | 6 | 3.90 | 2.560 | 6 | 0 |
| 4 | BDEE | 7 | 2.93 | 2.339 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 2.19 | 1.718 | 4 | 0 |
| 7 | MPROG | 5 | 2.04 | 1.757 | 5 | 0 |
| 8 | AFRCE | 9 | 4.60 | 2.910 | 9 | 0 |
| 9 | COE | 18 | 7.40 | 5.177 | 18 | 5 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.6821 | 0 | 5 |
| 2 | LEECC | 2 | 2.1969 | 0 | 6 |
| 3 | REQ | 6 | 2.0998 | 0 | 6 |
| 4 | BDEE | 7 | 4.0657 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 4 | 1.8086 | 0 | 4 |
| 7 | MPROG | 5 | 2.9559 | 0 | 5 |
| 8 | AFRCE | 9 | 4.4018 | 0 | 9 |
| 9 | COE | 13 | 10.6023 | 0 | 18 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0110 |
| 8 | DI | CLOSED | .1096 |
| 9 | DISTR | CLOSED | .0411 |
| 10 | CORPS | CLOSED | .0986 |
| 11 | REV30 | CLOSED | .0384 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .4621 |
| 14 | HOLD | OPEN | .9890 |
| 15 | HOLD1 | OPEN | .9890 |

**HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 23  .295  .100E+01 ****************                                  +
 25  .321  .200E+01 *****************                  C              +
 30  .385  .300E+01 ********************                              C
  0  .000  .400E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 78                 0        20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .209E+01 | .825E+00 | .395E+00 | .100E+01 | .300E+01 | 78 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 44  .564  .000E+00 +****************************                     +
  9  .115  .100E+01 +******                           C               +
  9  .115  .200E+01 +******                                 C         +
 14  .179  .300E+01 +*********                                       C+
  2  .026    INF    +*                                                C
---                 +    +    +    +    +    +    +    +    +    +    +
 78                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .103E+01 | .140E+01 | .136E+01 | .000E+00 | .600E+01 | 78 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 20  .870  .100E+01 +*******************************************      +
  0  .000  .200E+01 +                                          C      +
  3  .130  .300E+01 +*******                                          C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 23                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .126E+01 | .689E+00 | .546E+00 | .100E+01 | .300E+01 | 23 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA    UPPER
FREQ FREQ   CELL LIM 0        20        40        60        80       100
                     +    +    +    +    +    +    +    +    +    +    +
  0  .000   .000E+00 +                                                 +
  9  .391   .100E+01 *********************                             +
  3  .130   .200E+01 ********                   C                      +
  3  .130   .300E+01 ********                          C               +
  8  .348   .400E+01 ******************                                C
  0  .000     INF    +                                                 C
---                  +    +    +    +    +    +    +    +    +    +    +
 23                  0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .192E+01 | .142E+01 | .740E+00 | .238E+00 | .390E+01 | 23 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA    UPPER
FREQ FREQ   CELL LIM 0        20        40        60        80       100
                     +    +    +    +    +    +    +    +    +    +    +
  0  .000   .000E+00 +                                                 +
 14  .255   .100E+01 **************                                    +
 14  .255   .200E+01 **************             C                      +
  9  .164   .300E+01 *********                           C             +
 18  .327   .400E+01 *****************                                 C
  0  .000     INF    +                                                 C
---                  +    +    +    +    +    +    +    +    +    +    +
 55                  0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .207E+01 | .119E+01 | .577E+00 | .908E-01 | .395E+01 | 55 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL BY BLAKE & MARCHBANKS

DATE 8/16/1985 RUN NUMBER 1 OF 1

CURRENT TIME .5110E+04
STATISTICAL ARRAYS CLEARED AT TIME .4745E+04

END OF YEAR 14

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .191E+03 | .542E+02 | .283E+00 | .125E+03 | .284E+03 | 20 |
| DI OTHER AFRCES | .443E+03 | .894E+02 | .202E+00 | .143E+03 | .547E+03 | 195 |
| DI ISSUED | .342E+03 | .137E+03 | .402E+00 | .260E+03 | .651E+03 | 19 |
| DI FOR OTHER PRO | .441E+03 | .103E+03 | .233E+00 | .139E+03 | .535E+03 | 57 |
| TIME TO 30% | .587E+03 | .144E+03 | .245E+00 | .468E+03 | .881E+03 | 21 |
| OTHERS TO 30% | .658E+03 | .114E+03 | .174E+00 | .379E+03 | .787E+03 | 59 |
| CONG. DELAY | .772E+02 | .139E+01 | .179E-01 | .752E+02 | .781E+02 | 13 |
| TYPE PROJECT | .190E+01 | .768E+00 | .404E+00 | .100E+01 | .300E+01 | 61 |
| CONSTR. CHANGES | .738E+00 | .111E+01 | .150E+01 | .000E+00 | .300E+01 | 61 |
| TIME COMPLETE | .185E+04 | .303E+03 | .164E+00 | .134E+04 | .252E+04 | 21 |
| DELIVERY STATUS | .138E+01 | .805E+00 | .583E+00 | .100E+01 | .300E+01 | 21 |
| PRIORITY | .190E+01 | .109E+01 | .573E+00 | .493E-01 | .358E+01 | 21 |
| OTHERS COMPLETE | .194E+04 | .256E+03 | .132E+00 | .118E+04 | .233E+04 | 40 |
| PRIORITY OTHERS | .214E+01 | .101E+01 | .473E+00 | .574E+00 | .398E+01 | 40 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.780 | 5.048 | 14 | 0 | 68.992 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .122 | .398 | 2 | 0 | 2.221 |
| 4 | AWAIT | .291 | .879 | 5 | 0 | 5.314 |
| 5 | AWAIT | .040 | .197 | 2 | 0 | .735 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.235 | 82.022 | 251 | 251 | 158.677 |
| 9 | AWAIT | .060 | .313 | 2 | 0 | 1.093 |
| 10 | AWAIT | 64.332 | 49.906 | 159 | 38 | 100.778 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 12 | AWAIT | .011 | .102 | 1 | 0 | .428 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 13 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 14 | AWAIT | 27.753 | 64.606 | 251 | 0 | 22.713 |
| 15 | AWAIT | .001 | .032 | 1 | 0 | .185 |
| 16 | AWAIT | 5.978 | 15.431 | 47 | 0 | 23.715 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 4.446 | 16.379 | 109 | 0 | 5.988 |
| 19 | AWAIT | .001 | .034 | 1 | 0 | .060 |
| 20 | AWAIT | .027 | .163 | 1 | 0 | 1.430 |
| 21 | AWAIT | 12.043 | 27.036 | 107 | 0 | 16.220 |
| 22 | AWAIT | 1.166 | 2.875 | 11 | 0 | 12.894 |
| 23 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 24 | AWAIT | .617 | 1.803 | 17 | 0 | 2.963 |
| 25 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 26 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 27 | AWAIT | .001 | .024 | 1 | 0 | .043 |
| 28 | AWAIT | .149 | .721 | 11 | 0 | .717 |
| 29 | AWAIT | .002 | .041 | 1 | 0 | .040 |
| 30 | AWAIT | 1.643 | 1.484 | 6 | 1 | 7.314 |
| 31 | AWAIT | .016 | .125 | 1 | 0 | .388 |
| 32 | AWAIT | 1.058 | 1.409 | 4 | 0 | 25.742 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 35 | AWAIT | 1.465 | 4.832 | 26 | 0 | 6.600 |
| 36 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 37 | AWAIT | 24.789 | 16.991 | 52 | 45 | 89.584 |
| 38 | AWAIT | .058 | .266 | 2 | 0 | .307 |
| 39 | AWAIT | .014 | .116 | 1 | 0 | .209 |
| 40 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 41 | AWAIT | .686 | 4.236 | 36 | 0 | 3.577 |
| 42 | AWAIT | 16.243 | 12.663 | 45 | 16 | 68.940 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.855 | 6.075 | 20 | 19 | 101.590 |
| 45 | AWAIT | .023 | .149 | 1 | 0 | .634 |
| 46 | AWAIT | .337 | .743 | 2 | 0 | 9.453 |
| 47 | AWAIT | .012 | .111 | 1 | 0 | .348 |
| 48 | AWAIT | .019 | .135 | 1 | 0 | .178 |
| 49 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 50 | AWAIT | .134 | .341 | 1 | 0 | 16.301 |
| 51 | AWAIT | .029 | .169 | 1 | 0 | 3.587 |
| 52 | AWAIT | .133 | .511 | 3 | 0 | 2.419 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 55 | CALENDAR | 462.595 | 116.563 | 850 | 393 | 10.058 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .4715 | .9967 | 4 | 0 | 20 |
| 4 | 2.2434 | 2.2182 | 6 | 0 | 20 |
| 5 | .3326 | .6822 | 3 | 0 | 20 |
| 6 | 1.0950 | 1.3444 | 6 | 0 | 20 |
| 7 | .2448 | .5654 | 3 | 0 | 20 |
| 8 | .6964 | 1.0507 | 5 | 0 | 20 |
| 9 | 2.4468 | 19.9813 | 251 | 0 | 446 |
| 10 | 3.6489 | 22.8031 | 251 | 0 | 446 |
| 11 | .0000 | .0000 | 1 | 0 | 270 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 178 |
| 14 | .0000 | .0000 | 1 | 0 | 92 |
| 15 | 6.4640 | 15.9730 | 47 | 0 | 92 |
| 16 | .0000 | .0000 | 1 | 0 | 88 |
| 17 | .0000 | .0000 | 1 | 0 | 4 |
| 18 | .0596 | .3198 | 3 | 0 | 4 |
| 19 | .0663 | .3938 | 3 | 1 | 3 |
| 20 | 4.9462 | 13.1621 | 47 | 44 | 74 |
| 21 | .3674 | 1.1029 | 5 | 0 | 271 |
| 22 | .0000 | .0000 | 1 | 0 | 195 |
| 23 | .0000 | .0000 | 1 | 0 | 43 |
| 24 | .0000 | .0000 | 1 | 0 | 33 |
| 25 | .5608 | 1.3662 | 6 | 0 | 33 |
| 26 | .9585 | 3.0848 | 17 | 0 | 76 |
| 27 | 3.0971 | 6.3498 | 32 | 1 | 90 |
| 28 | 8.8279 | 10.3985 | 41 | 33 | 84 |
| 29 | 1.7105 | 2.8777 | 12 | 1 | 83 |
| 30 | 16.5038 | 13.4248 | 45 | 5 | 83 |
| 31 | 19.7090 | 12.7649 | 46 | 26 | 80 |
| 32 | .0000 | .0000 | 1 | 0 | 21 |
| 33 | .7165 | 1.8349 | 7 | 0 | 81 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 81 |
| 36 | 8.7224 | 8.6035 | 30 | 5 | 76 |
| 37 | 2.2604 | 2.6614 | 11 | 0 | 81 |
| 38 | .7771 | 1.0575 | 6 | 0 | 81 |
| 39 | 11.1627 | 12.8449 | 53 | 3 | 69 |
| 40 | .0000 | .0000 | 1 | 0 | 50 |
| 41 | 34.1526 | 14.5353 | 60 | 49 | 70 |
| 42 | 13.2164 | 8.3864 | 29 | 0 | 70 |
| 43 | 3.8719 | 3.4928 | 15 | 1 | 69 |
| 44 | 3.6431 | 3.0732 | 11 | 1 | 68 |
| 45 | 7.8820 | 15.5695 | 55 | 0 | 70 |
| 46 | 1.3637 | 3.9327 | 26 | 0 | 70 |
| 47 | 111.1584 | 14.2720 | 134 | 129 | 65 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | .6541 | .8453 | 3 | 1 | 38 |
| 49 | .1920 | .4548 | 2 | 2 | 11 |
| 50 | .3411 | .6016 | 2 | 2 | 1 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0274 | .1632 | 1 | 0 | 2 |
| 94 | .0000 | .0000 | 1 | 0 | 7 |
| 95 | .0000 | .0000 | 1 | 0 | 24 |
| 97 | .1233 | .3288 | 1 | 0 | 9 |
| 98 | .0986 | .2982 | 1 | 0 | 9 |
| 99 | .0411 | .1985 | 1 | 0 | 15 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.29 | 1.723 | 5 | 1 |
| 2 | LEECC | 6 | 3.20 | 1.940 | 6 | 5 |
| 3 | REQ | 6 | 3.71 | 2.701 | 6 | 0 |
| 4 | BDEE | 7 | 2.95 | 2.212 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 2.35 | 1.838 | 4 | 0 |
| 7 | MPROG | 5 | 1.91 | 1.786 | 5 | 0 |
| 8 | AFRCE | 9 | 5.07 | 2.878 | 9 | 2 |
| 9 | COE | 18 | 7.45 | 4.668 | 18 | 7 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 4 | 3.7115 | 0 | 5 |
| 2 | LEECC | 1 | 2.8025 | 0 | 6 |
| 3 | REQ | 6 | 2.2871 | 0 | 6 |
| 4 | BDEE | 7 | 4.0453 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 4 | 1.6493 | 0 | 4 |
| 7 | MPROG | 5 | 3.0942 | 0 | 5 |
| 8 | AFRCE | 7 | 3.9327 | 0 | 9 |
| 9 | COE | 11 | 10.5506 | 0 | 18 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0110 |
| 8 | DI | CLOSED | .1233 |
| 9 | DISTR | CLOSED | .0411 |
| 10 | CORPS | CLOSED | .0986 |
| 11 | REV30 | CLOSED | .0411 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .4493 |
| 14 | HOLD | OPEN | .9890 |
| 15 | HOLD1 | OPEN | .9890 |

**HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ CELL LIM  0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
   0  .000 .000E+00 +                                                 +
  21  .344 .100E+01 +*****************                                +
  25  .410 .200E+01 +********************                 C           +
  15  .246 .300E+01 +************                                     C
   0  .000 .400E+01 +                                                 C
   0  .000   INF    +                                                 C
 ---                +    +    +    +    +    +    +    +    +    +    +
  61                0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .190E+01 | .768E+00 | .404E+00 | .100E+01 | .300E+01 | 61 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 39  .639  .000E+00 *********************************                 +
  7  .115  .100E+01 *******                              C            +
  7  .115  .200E+01 *******                                   C       +
  8  .131  .300E+01 ********                                          C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 61                 0        20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .738E+00 | .111E+01 | .150E+01 | .000E+00 | .300E+01 | 61 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 17  .810  .100E+01 ******************************************        +
  0  .000  .200E+01 +                                        C        +
  4  .190  .300E+01 ***********                                       C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 21                 0        20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .138E+01 | .805E+00 | .583E+00 | .100E+01 | .300E+01 | 21 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80      100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  5  .238  .100E+01 +************                                     +
  7  .333  .200E+01 +*****************           C                    +
  5  .238  .300E+01 +************                           C         +
  4  .190  .400E+01 +**********                                       C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 21                 0         20        40        60        80      100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .190E+01 | .109E+01 | .573E+00 | .493E-01 | .358E+01 | 21 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80      100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  7  .175  .100E+01 +*********                                        +
 11  .275  .200E+01 +**************       C                           +
 13  .325  .300E+01 +****************                      C          +
  9  .225  .400E+01 +***********                                      C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 40                 0         20        40        60        80      100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .214E+01 | .101E+01 | .473E+00 | .574E+00 | .398E+01 | 40 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/16/1985                                 RUN NUMBER 1 OF 1

CURRENT TIME .5475E+04
STATISTICAL ARRAYS CLEARED AT TIME .5110E+04

END OF YEAR 15

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .172E+03 | .521E+02 | .302E+00 | .985E+02 | .265E+03 | 20 |
| DI OTHER AFRCES | .452E+03 | .121E+03 | .267E+00 | .148E+03 | .650E+03 | 225 |
| DI ISSUED | .354E+03 | .141E+03 | .400E+00 | .290E+03 | .655E+03 | 23 |
| DI FOR OTHER PRO | .440E+03 | .140E+03 | .319E+00 | .146E+03 | .650E+03 | 67 |
| TIME TO 30% | .577E+03 | .140E+03 | .243E+00 | .474E+03 | .926E+03 | 19 |
| OTHERS TO 30% | .670E+03 | .115E+03 | .171E+00 | .359E+03 | .814E+03 | 66 |
| CONG. DELAY | .716E+02 | .733E+01 | .103E+00 | .633E+02 | .777E+02 | 21 |
| TYPE PROJECT | .209E+01 | .814E+00 | .388E+00 | .100E+01 | .300E+01 | 74 |
| CONSTR. CHANGES | .919E+00 | .125E+01 | .136E+01 | .000E+00 | .300E+01 | 74 |
| TIME COMPLETE | .180E+04 | .201E+03 | .112E+00 | .141E+04 | .210E+04 | 21 |
| DELIVERY STATUS | .110E+01 | .436E+00 | .398E+00 | .100E+01 | .300E+01 | 21 |
| PRIORITY | .200E+01 | .116E+01 | .578E+00 | .114E-02 | .376E+01 | 21 |
| OTHERS COMPLETE | .200E+04 | .272E+03 | .136E+00 | .136E+04 | .248E+04 | 53 |
| PRIORITY OTHERS | .200E+01 | .108E+01 | .538E+00 | .606E-01 | .376E+01 | 53 |

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.396 | 4.916 | 14 | 0 | 61.973 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .065 | .343 | 2 | 0 | 1.183 |
| 4 | AWAIT | .153 | .438 | 2 | 0 | 2.800 |
| 5 | AWAIT | .023 | .151 | 1 | 0 | .427 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.174 | 82.019 | 251 | 251 | 158.632 |
| 9 | AWAIT | .019 | .135 | 1 | 0 | .339 |
| 10 | AWAIT | 69.913 | 52.972 | 165 | 36 | 105.885 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 12 | AWAIT | .384 | .486 | 1 | 0 | 34.997 |

**FILE STATISTICS (CONTINUED)**

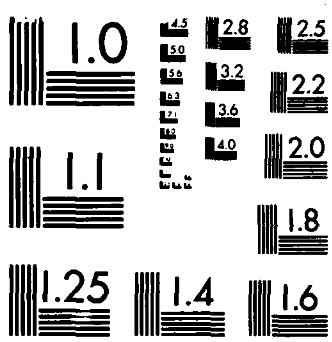
| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 13 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 14 | AWAIT | 30.891 | 69.148 | 251 | 0 | 24.727 |
| 15 | AWAIT | .001 | .024 | 1 | 0 | .108 |
| 16 | AWAIT | 4.266 | 12.333 | 49 | 0 | 20.222 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 4.919 | 17.558 | 110 | 0 | 5.700 |
| 19 | AWAIT | .355 | .478 | 1 | 0 | 32.372 |
| 20 | AWAIT | .011 | .105 | 1 | 0 | 1.016 |
| 21 | AWAIT | 28.741 | 39.812 | 163 | 0 | 33.303 |
| 22 | AWAIT | .837 | 2.086 | 9 | 0 | 11.317 |
| 23 | AWAIT | .035 | .183 | 1 | 0 | 2.536 |
| 24 | AWAIT | 1.819 | 8.339 | 50 | 0 | 7.376 |
| 25 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 26 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 27 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 28 | AWAIT | .128 | .645 | 12 | 0 | .520 |
| 29 | AWAIT | .016 | .126 | 1 | 0 | .395 |
| 30 | AWAIT | 1.896 | 1.501 | 6 | 3 | 8.046 |
| 31 | AWAIT | 1.034 | 1.536 | 5 | 0 | 25.171 |
| 32 | AWAIT | 1.409 | 1.261 | 3 | 2 | 34.293 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | .369 | .956 | 5 | 0 | 1.727 |
| 35 | AWAIT | 5.113 | 9.774 | 37 | 0 | 24.235 |
| 36 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 37 | AWAIT | 35.844 | 27.506 | 77 | 44 | 107.237 |
| 38 | AWAIT | .266 | 1.042 | 7 | 0 | 1.278 |
| 39 | AWAIT | .080 | .271 | 1 | 0 | 2.077 |
| 40 | AWAIT | .031 | .172 | 1 | 0 | 2.231 |
| 41 | AWAIT | 1.033 | 4.744 | 45 | 0 | 5.628 |
| 42 | AWAIT | 14.176 | 12.653 | 48 | 5 | 71.864 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.408 | 6.193 | 20 | 19 | 97.410 |
| 45 | AWAIT | .235 | .566 | 2 | 0 | 6.585 |
| 46 | AWAIT | 1.983 | 2.518 | 8 | 0 | 60.316 |
| 47 | AWAIT | .047 | .411 | 5 | 4 | 1.443 |
| 48 | AWAIT | .713 | 1.447 | 5 | 0 | 4.197 |
| 49 | AWAIT | .015 | .120 | 1 | 0 | 1.076 |
| 50 | AWAIT | 1.047 | 1.432 | 4 | 1 | 76.450 |
| 51 | AWAIT | .003 | .058 | 1 | 1 | .609 |
| 52 | AWAIT | .102 | .426 | 3 | 0 | 1.854 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 55 | CALENDAR | 441.676 | 123.208 | 835 | 397 | 9.419 |

## **REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .5163 | 1.0334 | 5 | 0 | 20 |
| 4 | 2.1299 | 2.1593 | 6 | 0 | 20 |
| 5 | .3489 | .6269 | 3 | 0 | 20 |
| 6 | .9297 | 1.2230 | 5 | 0 | 20 |
| 7 | .1657 | .4180 | 2 | 0 | 20 |
| 8 | .7219 | 1.0862 | 4 | 0 | 20 |
| 9 | 2.4809 | 19.9827 | 251 | 0 | 456 |
| 10 | 3.7444 | 23.1103 | 251 | 0 | 456 |
| 11 | .0000 | .0000 | 1 | 0 | 275 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 198 |
| 14 | .0000 | .0000 | 1 | 0 | 77 |
| 15 | 5.8822 | 13.3735 | 49 | 28 | 49 |
| 16 | .0000 | .0000 | 1 | 0 | 47 |
| 17 | .0000 | .0000 | 1 | 0 | 2 |
| 18 | .0335 | .2481 | 2 | 0 | 2 |
| 19 | .0599 | .3165 | 2 | 0 | 3 |
| 20 | 4.2931 | 13.2743 | 49 | 0 | 94 |
| 21 | .4332 | 1.2157 | 5 | 0 | 315 |
| 22 | .0000 | .0000 | 1 | 0 | 225 |
| 23 | .0000 | .0000 | 1 | 0 | 63 |
| 24 | .0000 | .0000 | 1 | 0 | 27 |
| 25 | .5045 | 1.4811 | 6 | 0 | 27 |
| 26 | 1.0917 | 5.7366 | 56 | 0 | 90 |
| 27 | 3.7992 | 11.7440 | 59 | 37 | 54 |
| 28 | 5.9122 | 8.4649 | 34 | 22 | 65 |
| 29 | .9470 | 1.9833 | 13 | 0 | 66 |
| 30 | 12.9867 | 10.6139 | 35 | 0 | 71 |
| 31 | 19.4502 | 8.5976 | 37 | 12 | 85 |
| 32 | .0000 | .0000 | 1 | 0 | 19 |
| 33 | .8483 | 1.9382 | 7 | 0 | 83 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 83 |
| 36 | 9.7498 | 4.8620 | 23 | 6 | 82 |
| 37 | 2.2499 | 2.4496 | 10 | 0 | 82 |
| 38 | .7035 | .9711 | 5 | 1 | 77 |
| 39 | 12.4817 | 19.6784 | 77 | 5 | 76 |
| 40 | .0000 | .0000 | 1 | 0 | 58 |
| 41 | 31.8485 | 23.3314 | 72 | 72 | 52 |
| 42 | 9.8213 | 10.9142 | 36 | 0 | 51 |
| 43 | 2.9167 | 3.9838 | 14 | 0 | 52 |
| 44 | 3.0388 | 3.6238 | 14 | 0 | 56 |
| 45 | 7.8343 | 16.8845 | 61 | 0 | 67 |
| 46 | 1.2988 | 3.8938 | 24 | 0 | 67 |
| 47 | 104.5689 | 17.5278 | 129 | 115 | 80 |

AD-A161 116 ANALYSIS AND MODELING OF THE FACILITY ACQUISITION PROCESS AS IT RELATES T (U) AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYST L J BLAKE 3/4

UNCLASSIFIED SEP 85 AFIT/GEM/LSY/85S-9 F/G 15/5 NL




MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | 1.0303 | .9783 | 4 | 0 | 63 |
| 49 | .1219 | .4017 | 2 | 2 | 8 |
| 50 | .2259 | .4460 | 2 | 0 | 3 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0274 | .1632 | 1 | 0 | 2 |
| 94 | .0000 | .0000 | 1 | 0 | 4 |
| 95 | .0000 | .0000 | 1 | 0 | 14 |
| 97 | .0685 | .2526 | 1 | 0 | 5 |
| 98 | .0475 | .2126 | 1 | 1 | 4 |
| 99 | .0411 | .1985 | 1 | 0 | 15 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.36 | 1.736 | 5 | 0 |
| 2 | LEECC | 6 | 2.79 | 2.455 | 6 | 6 |
| 3 | REQ | 6 | 3.44 | 2.693 | 6 | 0 |
| 4 | BDEE | 7 | 3.97 | 1.602 | 7 | 4 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 3.35 | 1.197 | 4 | 4 |
| 7 | MPROG | 5 | 1.80 | 1.800 | 5 | 0 |
| 8 | AFRCE | 9 | 6.39 | 2.801 | 9 | 9 |
| 9 | COE | 18 | 10.85 | 5.469 | 18 | 13 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.6439 | 0 | 5 |
| 2 | LEECC | 0 | 3.2064 | 0 | 6 |
| 3 | REQ | 6 | 2.5635 | 0 | 6 |
| 4 | BDEE | 3 | 3.0291 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 0 | .6471 | 0 | 4 |
| 7 | MPROG | 5 | 3.1968 | 0 | 5 |
| 8 | AFRCE | 0 | 2.6097 | 0 | 9 |
| 9 | COE | 5 | 7.1510 | 0 | 16 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0110 |
| 8 | DI | CLOSED | .0685 |
| 9 | DISTR | CLOSED | .0274 |
| 10 | CORPS | OPEN | .0475 |
| 11 | REV30 | CLOSED | .0411 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .3147 |
| 14 | HOLD | OPEN | .9890 |
| 15 | HOLD1 | OPEN | .9890 |

**HISTOGRAM NUMBER 9**

TYPE PROJECT

```
 OBS  RELA   UPPER
FREQ  FREQ  CELL LIM 0         20        40        60        80       100
                     +    +    +    +    +    +    +    +    +    +    +
   0  .000  .000E+00 +                                                 +
  21  .284  .100E+01 +**************                                   +
  25  .338  .200E+01 +*****************             C                  +
  28  .378  .300E+01 +*******************                              C
   0  .000  .400E+01 +                                                 C
   0  .000    INF    +                                                 C
 ---                 +    +    +    +    +    +    +    +    +    +    +
  74                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .209E+01 | .814E+00 | .388E+00 | .100E+01 | .300E+01 | 74 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 45  .608  .000E+00 +******************************                   +
  5  .068  .100E+01 +***                              C               +
  9  .122  .200E+01 +******                                 C         +
 15  .203  .300E+01 +**********                                       C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 74                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .919E+00 | .125E+01 | .136E+01 | .000E+00 | .300E+01 | 74 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 20  .952  .100E+01 +************************************************ +
  0  .000  .200E+01 +                                               C +
  1  .048  .300E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 21                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .110E+01 | .436E+00 | .398E+00 | .100E+01 | .300E+01 | 21 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  4  .190  .100E+01 +**********                                       +
  7  .333  .200E+01 +*****************       C                        +
  5  .238  .300E+01 +************                        C            +
  5  .238  .400E+01 +************                                     C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 21                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .200E+01 | .116E+01 | .578E+00 | .114E-02 | .376E+01 | 21 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 11  .208  .100E+01 +**********                                       +
 16  .302  .200E+01 +***************        C                         +
 13  .245  .300E+01 +************                         C           +
 13  .245  .400E+01 +************                                     C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 53                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .200E+01 | .108E+01 | .538E+00 | .606E-01 | .376E+01 | 53 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/16/1985                                  RUN NUMBER 1 OF 1

CURRENT TIME .5840E+04
STATISTICAL ARRAYS CLEARED AT TIME .5475E+04

END OF YEAR 16

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO USAF | .197E+03 | .505E+02 | .256E+00 | .123E+03 | .286E+03 | 20 |
| DI OTHER AFRCES | .418E+03 | .113E+03 | .270E+00 | .136E+03 | .678E+03 | 223 |
| DI ISSUED | .285E+03 | .842E+02 | .295E+00 | .259E+03 | .641E+03 | 20 |
| DI FOR OTHER PRO | .451E+03 | .126E+03 | .280E+00 | .169E+03 | .658E+03 | 62 |
| TIME TO 30% | .588E+03 | .153E+03 | .260E+00 | .473E+03 | .932E+03 | 23 |
| OTHERS TO 30% | .676E+03 | .146E+03 | .215E+00 | .406E+03 | .915E+03 | 60 |
| CONG. DELAY | .683E+02 | .128E+02 | .188E+00 | .612E+02 | .899E+02 | 16 |
| TYPE PROJECT | .231E+01 | .822E+00 | .356E+00 | .100E+01 | .300E+01 | 75 |
| CONSTR. CHANGES | .112E+01 | .140E+01 | .125E+01 | .000E+00 | .500E+01 | 75 |
| TIME COMPLETE | .189E+04 | .244E+03 | .129E+00 | .129E+04 | .235E+04 | 17 |
| DELIVERY STATUS | .124E+01 | .664E+00 | .538E+00 | .100E+01 | .300E+01 | 17 |
| PRIORITY | .201E+01 | .960E+00 | .477E+00 | .388E+00 | .381E+01 | 17 |
| OTHERS COMPLETE | .203E+04 | .320E+03 | .158E+00 | .150E+04 | .273E+04 | 58 |
| PRIORITY OTHERS | .221E+01 | .103E+01 | .463E+00 | .270E-01 | .395E+01 | 58 |

## **FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 1 | AWAIT | 3.753 | 5.165 | 14 | 0 | 68.485 |
| 2 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 3 | AWAIT | .384 | 1.013 | 4 | 0 | 7.003 |
| 4 | AWAIT | .339 | .999 | 5 | 0 | 6.189 |
| 5 | AWAIT | .094 | .352 | 2 | 0 | 1.722 |
| 6 | AWAIT | 164.041 | 83.464 | 250 | 250 | 119.511 |
| 7 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 8 | AWAIT | 218.366 | 81.808 | 251 | 251 | 158.772 |
| 9 | AWAIT | .119 | .525 | 3 | 0 | 2.175 |
| 10 | AWAIT | 64.972 | 51.086 | 161 | 36 | 99.225 |
| 11 | AWAIT | .000 | .000 | 1 | 0 | .000 |

**FILE STATISTICS (CONTINUED)**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| 12 | AWAIT | .224 | .417 | 1 | 0 | 8.183 |
| 13 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 14 | AWAIT | 13.855 | 45.284 | 251 | 0 | 11.139 |
| 15 | AWAIT | .005 | .073 | 1 | 0 | .980 |
| 16 | AWAIT | 4.564 | 11.288 | 38 | 2 | 24.499 |
| 17 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 18 | AWAIT | 8.412 | 22.091 | 109 | 0 | 9.969 |
| 19 | AWAIT | .438 | .496 | 1 | 0 | 20.000 |
| 20 | AWAIT | .009 | .093 | 1 | 0 | .397 |
| 21 | AWAIT | 16.038 | 16.374 | 77 | 3 | 19.006 |
| 22 | AWAIT | .293 | 1.121 | 6 | 0 | 4.284 |
| 23 | AWAIT | .026 | .158 | 1 | 0 | 1.044 |
| 24 | AWAIT | .946 | 3.130 | 21 | 0 | 4.209 |
| 25 | AWAIT | .019 | .135 | 1 | 0 | 1.366 |
| 26 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 27 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 28 | AWAIT | .309 | .960 | 9 | 0 | 1.377 |
| 29 | AWAIT | .001 | .036 | 1 | 0 | .034 |
| 30 | AWAIT | 1.566 | 1.642 | 7 | 4 | 6.647 |
| 31 | AWAIT | .537 | .989 | 3 | 0 | 14.013 |
| 32 | AWAIT | 2.000 | 1.872 | 5 | 0 | 45.619 |
| 33 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 34 | AWAIT | .103 | .486 | 5 | 0 | .448 |
| 35 | AWAIT | 2.926 | 6.405 | 35 | 0 | 12.564 |
| 36 | AWAIT | .000 | .018 | 1 | 0 | .123 |
| 37 | AWAIT | 40.721 | 24.842 | 70 | 54 | 116.118 |
| 38 | AWAIT | .736 | 2.454 | 14 | 0 | 3.631 |
| 39 | AWAIT | .098 | .297 | 1 | 0 | 2.237 |
| 40 | AWAIT | .010 | .098 | 1 | 0 | .878 |
| 41 | AWAIT | .593 | 3.159 | 31 | 0 | 3.134 |
| 42 | AWAIT | 6.524 | 8.853 | 41 | 4 | 32.621 |
| 43 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 44 | AWAIT | 10.800 | 6.083 | 20 | 19 | 101.077 |
| 45 | AWAIT | .058 | .235 | 1 | 0 | 1.334 |
| 46 | AWAIT | .709 | 1.175 | 4 | 0 | 15.233 |
| 47 | AWAIT | .140 | .609 | 5 | 0 | 2.431 |
| 48 | AWAIT | .017 | .128 | 1 | 0 | .121 |
| 49 | AWAIT | .000 | .000 | 1 | 0 | .000 |
| 50 | AWAIT | .010 | .102 | 1 | 0 | .543 |
| 51 | AWAIT | .265 | .910 | 4 | 0 | 9.681 |
| 52 | AWAIT | .097 | .397 | 3 | 0 | 1.762 |
| 53 | AWAIT | .000 | .000 | 0 | 0 | .000 |
| 54 | AWAIT | .002 | .050 | 3 | 0 | .003 |
| 55 | CALENDAR | 456.697 | 111.620 | 834 | 359 | 9.695 |

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 1 | .0000 | .0000 | 0 | 0 | 0 |
| 2 | .0000 | .0000 | 0 | 0 | 0 |
| 3 | .4945 | .9250 | 3 | 0 | 20 |
| 4 | 2.1536 | 2.3269 | 6 | 0 | 20 |
| 5 | .3434 | .7600 | 4 | 0 | 20 |
| 6 | 1.1633 | 1.5765 | 6 | 0 | 20 |
| 7 | .2324 | .4973 | 3 | 0 | 20 |
| 8 | .6924 | 1.0672 | 5 | 0 | 20 |
| 9 | 2.4594 | 19.9467 | 251 | 0 | 454 |
| 10 | 3.7473 | 23.2183 | 251 | 0 | 454 |
| 11 | .0000 | .0000 | 1 | 0 | 262 |
| 12 | .0000 | .0000 | 0 | 0 | 0 |
| 13 | .0000 | .0000 | 1 | 0 | 194 |
| 14 | .0000 | .0000 | 1 | 0 | 68 |
| 15 | 6.2968 | 12.7237 | 38 | 0 | 94 |
| 16 | .0000 | .0000 | 1 | 0 | 88 |
| 17 | .0000 | .0000 | 1 | 0 | 6 |
| 18 | .1764 | .5731 | 3 | 0 | 6 |
| 19 | .1042 | .4243 | 3 | 0 | 6 |
| 20 | 5.4082 | 11.2790 | 38 | 0 | 94 |
| 21 | .4073 | 1.0502 | 5 | 0 | 308 |
| 22 | .0000 | .0000 | 1 | 0 | 223 |
| 23 | .0000 | .0000 | 1 | 0 | 57 |
| 24 | .0000 | .0000 | 1 | 0 | 25 |
| 25 | .4655 | 1.2540 | 6 | 0 | 25 |
| 26 | 1.0213 | 3.4398 | 25 | 0 | 82 |
| 27 | 2.5777 | 6.2736 | 37 | 7 | 112 |
| 28 | 12.9713 | 17.0577 | 59 | 22 | 112 |
| 29 | .8538 | 2.2955 | 16 | 15 | 97 |
| 30 | 17.2921 | 18.1972 | 59 | 9 | 88 |
| 31 | 21.8158 | 17.4881 | 58 | 17 | 83 |
| 32 | .0000 | .0000 | 1 | 0 | 23 |
| 33 | .6832 | 1.8272 | 11 | 0 | 82 |
| 34 | .0000 | .0000 | 0 | 0 | 0 |
| 35 | .0000 | .0000 | 1 | 0 | 82 |
| 36 | 9.1138 | 11.1412 | 46 | 6 | 82 |
| 37 | 2.1141 | 3.2011 | 13 | 0 | 82 |
| 38 | .8182 | 1.3041 | 6 | 0 | 85 |
| 39 | 12.5701 | 16.5128 | 70 | 5 | 74 |
| 40 | .0000 | .0000 | 1 | 0 | 48 |
| 41 | 33.1480 | 22.3563 | 74 | 66 | 76 |
| 42 | 13.5544 | 14.0149 | 45 | 1 | 69 |
| 43 | 3.8152 | 4.8311 | 19 | 0 | 69 |
| 44 | 3.7073 | 4.5861 | 16 | 0 | 68 |
| 45 | 8.1529 | 15.8905 | 57 | 0 | 69 |
| 46 | 1.3062 | 3.7933 | 27 | 0 | 69 |
| 47 | 94.9473 | 17.2293 | 117 | 117 | 68 |

**REGULAR ACTIVITY STATISTICS (CONTINUED)**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| 48 | .8124 | 1.0507 | 5 | 2 | 48 |
| 49 | .3663 | .8275 | 3 | 0 | 23 |
| 50 | 1.3901 | 1.6285 | 5 | 2 | 8 |
| 90 | .4493 | .4974 | 1 | 0 | 82 |
| 91 | .0822 | .2747 | 1 | 0 | 1 |
| 92 | .0110 | .1041 | 1 | 0 | 2 |
| 93 | .0411 | .1985 | 1 | 0 | 3 |
| 94 | .0000 | .0000 | 1 | 0 | 8 |
| 95 | .0000 | .0000 | 1 | 0 | 16 |
| 97 | .1233 | .3288 | 1 | 0 | 9 |
| 98 | .1060 | .3078 | 1 | 0 | 10 |
| 99 | .0384 | .1921 | 1 | 0 | 14 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.44 | 1.899 | 5 | 0 |
| 2 | LEECC | 6 | 3.13 | 2.300 | 6 | 6 |
| 3 | REQ | 6 | 3.56 | 2.614 | 6 | 0 |
| 4 | BDEE | 7 | 3.23 | 2.136 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 2.64 | 1.861 | 4 | 0 |
| 7 | MPROG | 5 | 2.01 | 1.895 | 5 | 0 |
| 8 | AFRCE | 9 | 6.93 | 2.644 | 9 | 3 |
| 9 | COE | 18 | 10.61 | 4.464 | 18 | 7 |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| 1 | LEECD | 5 | 3.5625 | 0 | 5 |
| 2 | LEECC | 0 | 2.8695 | 0 | 6 |
| 3 | REQ | 6 | 2.4383 | 0 | 6 |
| 4 | BDEE | 7 | 3.7702 | 0 | 7 |
| 5 | BASE | 1 | 1.0000 | 1 | 1 |
| 6 | MDEE | 4 | 1.3612 | 0 | 4 |
| 7 | MPROG | 5 | 2.9898 | 0 | 5 |
| 8 | AFRCE | 6 | 2.0669 | 0 | 8 |
| 9 | COE | 11 | 7.3939 | 0 | 18 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0164 |
| 8 | DI | CLOSED | .1233 |
| 9 | DISTR | CLOSED | .0548 |
| 10 | CORPS | CLOSED | .1060 |
| 11 | REV30 | CLOSED | .0384 |
| 12 | CALL2 | CLOSED | .2469 |
| 13 | DI100 | OPEN | .3103 |
| 14 | HOLD | OPEN | .9836 |
| 15 | HOLD1 | OPEN | .9836 |

**HISTOGRAM NUMBER 9**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 17  .227  .100E+01 +***********                                      +
 18  .240  .200E+01 +************         C                           +
 40  .533  .300E+01 +***************************                      C
  0  .000  .400E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 75                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .231E+01 | .822E+00 | .356E+00 | .100E+01 | .300E+01 | 75 |

**HISTOGRAM NUMBER 10**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 40  .533  .000E+00 +***************************                      +
  9  .120  .100E+01 +******                          C                +
  7  .093  .200E+01 +*****                               C            +
 17  .227  .300E+01 +***********                                     C+
  2  .027    INF    +*                                                C
---                 +    +    +    +    +    +    +    +    +    +    +
 75                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .112E+01 | .140E+01 | .125E+01 | .000E+00 | .500E+01 | 75 |

**HISTOGRAM NUMBER 12**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 15  .882  .100E+01 +********************************************     +
  0  .000  .200E+01 +                                           C     +
  2  .118  .300E+01 +******                                           C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 17                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .124E+01 | .664E+00 | .538E+00 | .100E+01 | .300E+01 | 17 |

**HISTOGRAM NUMBER 13**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  2  .118  .100E+01 +******                                           +
  6  .353  .200E+01 +******************     C                         +
  7  .412  .300E+01 +*********************                  C         +
  2  .118  .400E+01 +******                                           C
  0  .000    INF    +                                                 C
 ---                +    +    +    +    +    +    +    +    +    +    +
 17                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .201E+01 | .960E+00 | .477E+00 | .388E+00 | .381E+01 | 17 |

**HISTOGRAM NUMBER 15**

PRIORITY OTHERS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  8  .138  .100E+01 +*******                                          +
 16  .276  .200E+01 +**************     C                             +
 18  .310  .300E+01 +****************                C                +
 16  .276  .400E+01 +**************                                   C
  0  .000    INF    +                                                 C
 ---                +    +    +    +    +    +    +    +    +    +    +
 58                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY OTHERS | .221E+01 | .103E+01 | .463E+00 | .270E-01 | .395E+01 | 58 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL        BY BLAKE & MARCHBANKS

DATE  8/16/1985                              RUN NUMBER  1 OF  1

CURRENT TIME    .5840E+04
STATISTICAL ARRAYS CLEARED AT TIME   .5840E+04

END OF SIMULATION RUN

## Appendix D: Integrated Systems and Facilities Acquisition Model

```
*************************************************************************
*                                                                       *
*        INTEGRATED SYSTEMS AND FACILITIES ACQUISITION MODEL            *
*                                                                       *
*                           (NORMAL MODEL)                              *
*                                                                       *
*                               USING                                   *
*                                                                       *
*                  * * * * * * * * * * * * * * *                        *
*                  *                           *                        *
*                  *     SLAM II VERSION 2.1   *                        *
*                  *                           *                        *
*                  * * * * * * * * * * * * * * *                        *
*                                                                       *
*                                                                       *
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*                                                                       *
*                                                                       *
*************************************************************************
```

ECHO OF INPUT PROGRAM

```
GEN,BLAKE & MARCHBANKS,FACILITY MODEL,8/16/85,1,Y,N,Y,N,Y,1,72;
LIMITS,54,10,2000;
INTLC,XX(1)=0,XX(2)=0,XX(3)=0,XX(4)=0,XX(5)=0,XX(6)=0,XX(7)=0;
INTLC,XX(8)=0,XX(9)=0,XX(10)=0,XX(13)=0,XX(14)=0,XX(15)=0,XX(88)=0;
PRIORITY/1,LVF(9),/2,LVF(9)/3,LVF(9)/4,LVF(9)/5,LVF(9)/8,LVF(9);
PRIORITY/9,LVF(9)/10,LVF(9)/14,LVF(9)/17,LVF(9)/18,LVF(9);
PRIORITY/21,LVF(9)/22,FIFO/24,LVF(9)/28,LVF(9)/30,LVF(9)/31,HVF(7);
PRIORITY/32,HVF(7)/33,HVF(7)/34,LVF(9)/35,LVF(9)/37,LVF(9)/38,LVF(9);
PRIORITY/41,LVF(9)/42,LVF(9)/45,LVF(9)/46,LVF(9)/47,LVF(9)/48,LVF(9);
PRIORITY/49,LVF(9)/50,LVF(9)/51,LVF(9)/52,LVF(9);
;
;
;    EXPLANATION OF FILE PRIORITIES:
;
;       PRIORITIZED FILES, LVF(9) = LOWEST VALUE FIRST BASED ON VALUE
; RECORDED IN FILE NO. 9.  FILE 9 IS THE ASSIGNED PROJECT PRIORITY.
; HVF(7) = HIGHEST VALUE FIRST BASED ON VALUE IN FILE NUMBER 7.  FILE
; 7 RECORDS THE NUMBER OF RESOURCE UNITS REQUIRED FOR AN ACTIVITY.
; THUS IT WILL PROCESS THOSE REQUIRING THE MOST RESOURCES FIRST.
; FIFO = FIRST IN FIRST OUT.  ALL FILES NOT OTHERWISE SPECIFIED USE
; FIFO PROCESSING.
;
;
;            ****************************************
;            *                                      *
;            *  INTEGRATED SYSTEMS AND FACILITIES   *
;            *                MODEL                 *
;            *                                      *
;            *         TIME UNIT IS ONE DAY         *
;            *       DAY 1, 366, ECT. =  1 JAN      *
;            *                                      *
;            *         REV E - 16 AUG. 85           *
;            *           (NORMAL MODEL)             *
;            ****************************************
;
;
;
;       RESOURCE STATEMENTS REPRESENT INDIVIDUALS ASSIGNED TO THE
; VARIOUS ORGANIZATIONS INVOLVED IN THE ACQUISITION OF AIR FORCE
; FACILITIES UNDER THE MILITARY CONSTRUCTION PROGRAM.
;       THE NUMBER IN PARENTHESIS REPRESENTS THE NUMBER OF PEOPLE
; ASSIGNED TO THE FUNCTIONAL AREA REPRESENTED.  THE OTHER NUMBERS
; REPRESENT THE FILES IN WHICH PROJECTS ARE WAITING ACTION BY THE
; ORGANIZATION WHERE THE RESOURCE IS EMPLOYED.  THE RESOURCE WILL
; CONSIDER THE ORDER OF THE FILE LIST WHEN SELECTING A PROJECT TO
; SERVICE NEXT.
;
;
```

```
;
;
;
NETWORK;
     RESOURCE/LEECD(5),17,7,43,15,36,13,11,18;   AIR STAFF, PROGRAMS.
     RESOURCE/LEECC(6),40,39,47,51;             AIR STAFF,CONSTRUCTION.
     RESOURCE/REQ(6),4,22,1;                    BASE PROGRAMERS & ENGRS.
     RESOURCE/BDEE(7),33,9;                     BASE ENGINEERING.
     RESOURCE/BASE(1),2;                        MAJCOM MISSION PLANNERS(XR)
     RESOURCE/MDEE(4),32;                       MAJCOM,ENGINEERING.
     RESOURCE/MPROG(5),5,20,52,3;               MAJCOM PROGRAMERS.
     RESOURCE/AFRCE(9),19,35,31,23,12,46,50;  AFRCE PROJECT MANAGERS.
     RESOURCE/COE(18),26,27,29,34,41,25,48,49,45;  CORPS OF ENGINEERS
;                                                    PROJECT MANAGERS.
;
;      GATES ARE USED TO CONTROL THE FLOW OF PROJECTS THROUGH THE MCP
; PROCESS.  PROJECTS ARE STOPPED AT CLOSED GATES AND ACCUMULATE IN
; THE FILE ASSIGNED TO THE GATE.  WHEN THE GATE IS OPEN THE PROJECTS
; ARE ALLOWED TO PASS.  EITHER ALL OF THE PROJECTS IN THE FILE OR A
; SPECIFIED NUMBER OF THEM MAY PASS BEFORE THE GATE CLOSES.  GATE
; OPERATION IS CONTROLLED BY THE MODEL SEGMENTS LISTED PRIOR TO THE
; MAIN PROGRAM.  GATE OPENING IS DEPENDENT EITHER ON THE PASSAGE OF
; TIME OR THE ACCUMULATION OF A DEFINED NUMBER OF PROJECTS.
;
GATE/CALL,CLOSED,8;                             PROJECT CALL FOR ALL
                                                MODERNIZATION PROJECTS.
GATE/CALLN,CLOSED,10;                           PROJECT CALL FOR ALL
;                                               NON-MODERNIZATION PROJS
;                                               -1 NOV XX.
GATE/NEWFY,CLOSED,42;                           NEW FY, 1 OCT XX.
GATE/NEED,CLOSED,44;                            IDENTIFY REQ.
GATE/OTHER,CLOSED,6;                            PROJ. FROM OTHER MAJCOMS
GATE/CONG28,CLOSED,16;                          HOLD FOR TITLE 10 ACTION.
GATE/FRC,CLOSED,14;                             GROUP PROJS. BY 5 AT USAF
GATE/DI,CLOSED,24;                              WAITING FOR DI.
GATE/DISTR,CLOSED,21;                           WAITING AT AFRCE.
GATE/CORPS,CLOSED,28;                           WAITING FOR CORPS PM.
GATE/REV30,CLOSED,30;                           30% PROJ REVIEW.
GATE/CALL2,CLOSED,37;                           PROJS TO CONGRESS AROUND
;                                               1 JANUARY EACH YEAR.
GATE/DI100,CLOSED,38;                           100% DESIGN INSTRUCTION
;                                               (DI) TO MAJCOM AND AFRCE
;                                               EACH YEAR.
GATE/HOLD,OPEN,53;
GATE/HOLD1,OPEN,54;
;
;
;    MODEL SEGMENT A          ** RELEASE PROJECTS FOR PROGRAMMING **
;
;
;
;
```

```
     CREATE,,40,,1;
A1   GOON;
     ASSIGN,ATRIB(1) = TNOW;
A1A  OPEN,NEED,1;                              FACILITY REQUIREMENTS
     ASSIGN,XX(88) = TNOW + UNFRM(70,99);      PLAN (FRP) IS PRODUCED
     GOON,1;                                   EVERY 365 DAYS.  EACH
     ACT,,XX(4).GE.20,A2;                      PLAN IDENTIFIES A NEED
     ACT,1,,A1A;                               FOR 20 NON-MODERNIZA-
;                                              TION PROJECTS.
;
A2   CLOSE,NEED;
     ASSIGN,XX(4) = 0;                         COUNTER
     ASSIGN,ATRIB(1) = ATRIB(1) + 365 - TNOW;
     ACT,ATRIB(1),,A1;                         RECYCLE EVERY 365 DAYS.
;
;
;
     CREATE,365,45;
     ACT;
A3   ASSIGN,ATRIB(1) = TNOW;
A4   GOON;
A4A  OPEN,OTHER,1;                             RELEASE 250 PROJECTS
     ACT,,XX(6).GE.250,A5;                     FROM OTHER MAJCOMS
     ACT,1,,A4;                                EACH YEAR.
A5   CLOSE,OTHER;
     ASSIGN,XX(6) = 0;
A6   GOON,1;
     ACT,,TNOW - ATRIB(1).GE.165,A7;           CALL OCCURS IN AUGUST.
     ACT/90,2,,A6;
A7   OPEN,CALL2;                               CALL FOR PROJS AT 35%
;                                              DESIGN FOR SUBMISSION
;                                              TO CONGRESS (1 JAN).
     AWAIT(36),LEECD/2;                        WAIT FOR 2 STAFFERS
     ACT,90;                                   ACCEPT PROJECTS FOR
A8   CLOSE,CALL2;                              NEXT 60 DAYS.
     FREE,LEECD/2;
     GOON;
     TERMINATE;
;
;
;
;
;       MODEL SEGMENT B          ** AIR STAFF PROJECT CALL **
;
;
;
;
     CREATE,,180,,1;                           INITIALIZE AT DAY 180.
B0   GOON,2;                                   EACH YEAR. (AROUND
     ACT,,,B8;                                 JULY FIRST).
     ACT;
```

```
B1  OPEN,CALL;                             AIR STAFF CALL FOR PROJS
    ASSIGN,ATRIB(1) = TNOW;                (MODERNIZATION ONLY).
B2  AWAIT(7),LEECD/1;
    ACT,30;                                MAJCOM SUBMISSION.
B3  CLOSE,CALL;                            SUBMISSION PERIOD OVER.
    ASSIGN,ATRIB(1) = TNOW - ATRIB(1);     CALCULATE EXPIRED TIME.
    GOON,2;
    ACT,,,B6;
    ACT;
B4  GOON,1;
    ACT,,NNACT(10).EQ.0,B5;
    ACT,1,,B4;
B5  FREE,LEECD/1;                          RELEASE LEECD STAFFER.
    TERMINATE;
B6  GOON,1;
    ACT,90 - ATRIB(1);                     1 OCT XX
    OPEN,NEWFY;                            BEGIN NEW FY.
    ACT/91,30;                             1 NOV XX
    OPEN,CALLN;                            CALL FOR NON-MODERNIZA-
    GOON;                                  TION PROJECTS BY USAF.
    AWAIT(43),LEECD/1;                     LEECD STAFF PROJECTS.
    ACT,60;
    CLOSE,NEWFY;
    CLOSE,CALLN;
B7  GOON,1;
    ACT,,NNACT(10).EQ.0,B5;
    ACT,1,,B7;
B8  GOON,1;
    ACT,365,,B0;                           RECYCLE EVERY 365 DAYS
;
;
;
;
;      MODEL SEGMENT C       ** STAFF TITLE 10, 2807 ACTION **
;
;
;
;
    CREATE,,,,1;
C2  GOON,1;                                CHECK EVERY 30 DAYS
    ACT,,NNQ(16).GE.5,C3;                  FOR FIVE OR MORE
    ACT,30,,C2;                            PROJECTS REQUIRING
C3  GOON,1;                                CONGRESSIONAL ACTION.
    ACT,,NNQ(15).GT.0,C2;
    ACT,,NNQ(15).LE.0;
    AWAIT(15),LEECD/2;                     STAFF AT LEAST 5
    ASSIGN,XX(1) = UNFRM(21,45);           PROJECTS AT A TIME.
;                                          XX(1)= PROCESSING TIME.
    OPEN,CONG28;
    ACT/92,2;
C4  GOON,1;                                PROCESS UNTIL ALL
```

```
      ACT,,NNQ(16).EQ.0,C5;                              PROJECTS WAITING FOR
      ACT,1,,C4;                                         CONGRESSIONAL ACTION
C5    CLOSE,CONG28,1;                                    HAVE BEEN TRANSMITTED.
      ACT,,NNACT(20).EQ.0,C6;
      ACT,1,,C5;
C6    FREE,LEECD/2;                                      RELEASE LEECD WHEN ALL
      ACT,,,C2;                                          PROCESSING COMPLETE.
;
;
;
;
;        MODEL SEGMENT D          ** FACILITY PANEL ACTION **
;
;
;
;
      CREATE,,,,1;
D1    GOON,1;
      ACT,,NNQ(14).GT.0.AND.NNQ(14).EQ.XX(2),D3;
      ACT,,NNQ(14).GT.0.AND.NNQ(14).EQ.XX(15),D6;
      ACT,1,,D1;
D3    AWAIT(11)/LEECD/1;
      CLOSE,HOLD;                                        TEMPORARY DELAY WHILE
      CLOSE,HOLD1;                                       PROJECTS ENTER FACILITY
D4    OPEN,FRC;                                          PANEL (F PANEL).
      ACT,2;                                             F PANEL CONVENES.
      GOON,1;
      ACT,,NNQ(14).EQ.0,D5;
      ACT,2,,D4;
D5    CLOSE,FRC;
      OPEN,HOLD;                                         END TEMPORARY DELAY.
      OPEN,HOLD1;                                 NOTE:  GATES HOLD & HOLD1 ARE
      ASSIGN,XX(2) = 0;                                  USED IN FIRST 2 OR 3
      ACT,,,D7A;                                         YEARS OF THE MODEL RUN.
D6    AWAIT(13),LEECD/1;                                 THEY CONTINUE TO OPEN
      CLOSE,HOLD;                                        & CLOSE THROUHGOUT THE
      CLOSE,HOLD1;                                       SIMULATION PERIOD, BUT
D6A   OPEN,FRC;                                          DO NOT CAUSE DELAY OF
      ACT,2;                                             PROJECTS.  THEY ACT TO
      GOON,1;                                            ARTIFICIALLY CLOSE
      ACT,,NNQ(14).EQ.0,D7;                              GATE OTHER SHOULD IT
      ACT,1,,D6A;                                        BE OPEM WHEN GATE FRC
D7    CLOSE,FRC;                                         OPENS.
      OPEN,HOLD;
      OPEN,HOLD1;
      ASSIGN,XX(15) = 0;
D7A   GOON,2;
      ACT,,,D1;
      ACT/93,5;
D8    GOON,1;
      ACT,,NNACT(21).EQ.0,D9;
      ACT,1,,D8;                                         RELEASE LEECD WHEN ALL
```

```
D9   FREE,LEECD/1;                                     THE PROJECTS RELEASED
     TERMINATE;                                        COMPLETE ACTIVITY 21.
     GOON;
;
;
;
;
;
;        MODEL SEGMENT E     **DISTRIBUTE DESIGN INSTRUCTIONS**
;
;
;
;
     CREATE,30,30,3,,1;
E0   GOON,1;
     ASSIGN,ATRIB(5) = TNOW - ATRIB(3);
     GOON,1;
     ACT,,ATRIB(5).GE.16,E5A;
     ACT,1;
     GOON,1;
     ACT,,NNQ(21).GT.0.AND.NNQ(21).LE.10,E2;
     ACT,,NNQ(21).EQ.0,E0;
     ACT,,NNQ(21).GT.10,E1;
     ACT,,,E5A;
E1   ASSIGN,ATRIB(4) = 2;
     ACT,,,E3;
E2   ASSIGN,ATRIB(4) = 1;
E3   AWAIT(19/1),AFRCE/ATRIB(4),BALK(E5A);
     AWAIT(20/1),MPROG/ATRIB(4),BALK(E5;
     ACT/94;
     OPEN,DISTR,1;                                     USAF DISTRIBUTES DI'S.
     ACT,,TNOW.GE.ATRIB(3) + 5,E4;
     ACT,5;
E4   CLOSE, DISTR;
     ACT,UNFRM(5,15);                                  PROCESS DI.
     FREE,MPROG/ATRIB(4);
E5   FREE,AFRCE/ATRIB(4);                              FREE AFRCE AND MAJCOM
E5A  TERMINATE;                                        AFTER RECIEPT OF DI.
;
;        MODEL SEGMENT E1    ** 35% DESIGN BEING PROCESSED AT USAF **
;
;
     CREATE,,250,,1,1;
     ACT;
E6   ASSIGN,ATRIB(1) = TNOW;
E7   GOON,1;
     ACT,,NNQ(38).GT.0,E8;
     ACT,5,,E7;
E8   AWAIT(39),LEECC/1;                                WAIT FOR LEECC STAFFER.
     ASSIGN,ATRIB(3) = 1;
     ACT/95;                                           ISSUE APPROVAL TO
E9   OPEN,DI100;                                       PROCEED WITH PROJECT
```

```
      GOON,1;                                                DESIGN TO 100%.
      ACT,,XX(3).GT.0.AND.XX(3).LE.5,E13;
      ACT,,XX(3).GT.5.AND.XX(3).LE.10,E10;
      ACT,,XX(3).GT.10,E11;
      ACT,5,,E9;
E10   ASSIGN,ATRIB(3) = 2;                                   INCREASE REQUIREMENT
      ACT,,,E12;                                             FOR LEECC STAFF BY 1.
E11   ASSIGN,ATRIB(3) = 3;                                   INCREASE REQUIREMENT
      ACT,,,E12;                                             BY 2. (BASED ON # OF
E12   ASSIGN,ATRIB(4) = ATRIB(3) - 1;                        PROJECTS - XX(3).)
      AWAIT(40),LEECC/ATRIB(4);
E13   GOON;
      ACT,2;
      CLOSE,DI100;                                           RELEASE COMPLETED.
      ASSIGN,XX(3) = 0;
      GOON,2;
      ACT,,,E16;
      ACT,UNFRM(30,50);
E14   GOON,1;
      ACT,,NNACT(41).EQ.0,E15;
      ACT,,NNACT(41).NE.0;
      ACT,1,,E14;
E15   FREE,LEECC/ATRIB(3);                                   RELEASE LEECC STAFF.
      TERMINATE;
E16   GOON,1;
      ACT,,NNQ(38).GT.0,E8;                                  WAIT FOR MORE PROJECTS.
      ACT,1,,E16;
;
;
;
;
;
;
;
;        MODEL SEGMENT F        ** ISSUE DESIGN INSTRUCTION TO CORPS **
;
;
;
;
;
;
;
      CREATE,,,,1;
F1    GOON,1;
      ACT,,NNQ(24).GE.10,F2;                                 CHECK FOR 10 OR MORE
;                                                            IN FILE 24.
      ACT,,NNQ(24).GT.0.AND.NNQ(24).LT.10.AND.NNACT(25).EQ.0,F3;
      ACT,,,F7;
F2    ASSIGN,ATRIB(3) = 2;                                   ASSIGN 2 AFRCE PROJECT
      ACT,,,F4;                                              MANAGERS (PM).
F3    ASSIGN,ATRIB(3) = 1;                                   ASSIGN 1 AFRCE PM.
F4    GOON;
```

```
       AWAIT(23),AFRCE/ATRIB(3);
F5     OPEN,DI,1;                                        AFRCE FORWARDS DESIGN
       ACT,,NNQ(24).EQ.0,F6;                             INSTRUCTION TO COE.
       ACT,1,,F5;
F6     GOON,1
       ACT/97,5;
       CLOSE,DI;
       ACT,UNFRM(4,8);                                   AFRCE PROCESS FOR
       FREE,AFRCE/ATRIB(3);                              ISSUE OF DI TO COE.
F7     GOON,1;
       ACT,1,,F1;
;
;
;
;
;        MODEL  SEGMENT G      ** ARCHITECT-ENGINEER (AE) SELECTION **
;
;
;
;
       CREATE,,,,1;
G1     GOON;
       ACT;
       ASSIGN,ATRIB(3) = 0;                              RESET COUNTER
       GOON,1;                                           TAKE ONLY 1 OF THE
       ACT,,NNQ(28).EQ.0,G7;                             FOLLOWING ACTIVITIES.
       ACT,,NNQ(28).LT.5.AND.NNQ(24).EQ.0.AND.NNACT(26).EQ.0,G2;
       ACT,,NNQ(28).EQ.5,G2;
       ACT,,NNQ(28).GT.5,G5;
       ACT,,,G7;
G2     AWAIT(25),COE/1;                                  WAIT FOR COE PM.
       ASSIGN,ATRIB(3) = 1;                              ASSIGN 1 COE PM
       ASSIGN,XX(8) = UNFRM(20,35);                      ASSIGN TIMES FOR :
       ASSIGN,XX(9) = UNFRM(3,8);                        XX(8) = PREPARE DESIGN
                                                                 SCHEDULE.
       ASSIGN,XX(10) = EXPON(10,3);                      XX(9) = PREPARE CBD
                                                                 ANNOUNCEMENT.
G3     OPEN,CORPS,1;                                     XX(10) = AE SELECTION.
       ACT/98,4;
       GOON,1;
       ACT,,XX(7).LE.5.AND.XX(7).GT.0,G6;                ASSIGN GROUPS OF FIVE.
       ACT,,XX(7).GT.5,G4;
       ACT,1,,G3;
G4     AWAIT(26),COE/1;                                  ASSIGN ADDITIONAL COE
       ASSIGN,ATRIB(3) = 2;                              (2 ASSIGNED).
       ACT,,,G6;
G5     AWAIT(27),COE/2;                                   DI ISSUED TO COE.
       GOON;
       ASSIGN,XX(8) = UNFRM(20,55);
       ASSIGN,XX(9) = UNFRM(10,20);
       ASSIGN,XX(10) = EXPON(12,3);
       GOON;
```

```
        OPEN,CORPS,1;
        ACT/98,4;
        ASSIGN,ATRIB(3) = 2;                      ASSIGN TWO COE PMS.
    G6  CLOSE,CORPS;
        ASSIGN,XX(7) = 0;                         RESET COUNTER.
        GOON,2;                                   START DUAL PATH.
        ACT,1,,G1;
        ACT;
        AWAIT(12),AFRCE/1;
        ACT,XX(10);                               AE SELECTION BOARD.
        FREE,AFRCE/1;                             RELEASE AFRCE.
        GOON;
        ACT,UNFRM(5,21);                          NEGOTIATE WITH AE.
        GOON;
        ACT,9;
        GOON;
        ACT,UNFRM(5,20);                          PREPARE,SUBMIT AND
        FREE,COE/ATRIB(3);                        REVIEW AUDIT OF AE
        TERMINATE;
    G7  GOON;
        ACT,1,,G1;
        TERMINATE;
        GOON;
    ;
    ;
    ;
        CREATE,,,,1;
    G8  GOON,1;                                   ACCOMPLISH 30% DESIGN
    ;                                             REVIEW.
        ACT,,NNQ(30).GT.0.AND.NNQ(30).LT.5.AND.NNACT(31).EQ.0,G9;
        ACT,,NNQ(30).EQ.5,G9;
        ACT,,NNQ(30).GT.5.AND.NNQ(30).LE.15,G10;
        ACT,,NNQ(30).GT.15,G11;
        ACT,1,,G8
    G9  ASSIGN,ATRIB(7) = 1;                      ASSIGNING NUMBER OF
        ACT,,,G12;                                RESOURCES REQUIRED
    G10 ASSIGN,ATRIB(7) = 2;                      BASED ON NUMBER OF
        ACT,,,G12;                                PROJECTS WAITING.
    G11 ASSIGN,ATRIB(7) = 4;
    G12 GOON,1;
        ACT,,NNQ(29).EQ.0,G12A;                   SELECT ONE OF THE
        ACT,,NNQ(29).NE.0;                        FOLLOWING ACTIVITIES.
        GOON,1;
        ACT,1,,G8;
   G12A AWAIT(29),COE/ATRIB(7);
        ASSIGN,XX(21) = EXPON(3);                 TIME FOR COE TO DIS-
                                                  TRIBUTE 30% DESIGN
        ASSIGN,XX(22) = TNOW;                     TO REVIEWERS.
        OPEN,REV30;
        ACT/99,1;
        CLOSE,REV30;
        GOON,2;                                   TAKE BOTH OF FOLLOWING
```

```
        ACT,5,,G8;                                    ACTIVITIES.
        ACT;
        AWAIT(31),AFRCE/ATRIB(7);
        AWAIT(32),MDEE/ATRIB(7);
        AWAIT(33),BDEE/ATRIB(7);
    G13 GOON,1;
        ACT,,NNACT(36).EQ.0,G14;                      HOLD REVIEWERS UNTIL
        ACT,3,,G13;                                   PROJECTS COMPLETE
    G14 FREE,MDEE/ATRIB(7);                           REVIEW ACTIVITY IN
        FREE,BDEE/ATRIB(7);                           MAIN PROGRAM (ACT/36).
    G15 GOON,1;
        ACT,,NNACT(37).EQ.0,G16;
        ACT,3,,G15;
    G16 FREE,AFRCE/ATRIB(7);
        GOON,1;
        FREE,COE/ATRIB(7);
        TERMINATE;
  ;
  ;
  ;
  ;     * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  ;
  ;      * * * * * * * * * * *  MAIN PROGRAM   * * * * * * * * * * * *
  ;
  ;     * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  ;
  ;
  ;       ALL PROCESSING OF MCP PROJECTS IS ACCOMPLISHED IN THIS SEGMENT
  ; OF THE PROGRAM.  THE PRECEEDING SEGMENTS CONTROL TME MCP MILESTONES
  ; SUCH AS AIR STAFF PROJECT CALLS IN JULY AND NOVEMBER AND THE START
  ; OF NEW FY. THEY ALSO CONTROL PROJECT GROUP PROCESSING WHEN REQUIRED.
        CREATE,0,30,,20;
        ACT,,,M0;
        CREATE,17,47;
    M0  GOON;                                         GATE NEED, RELEASE IS
        AWAIT(44/20),NEED,BALK(M9);                   CONTROLED IN SEGMENT A
        ASSIGN,ATRIB(10) = XX(88);                    TIME FRP RELEASED.
        ACT;
        ASSIGN,XX(4) = XX(4) + 1;                     COUNT PROJECTS.
        ASSIGN,ATRIB(9) = UNFRM(0,4,2);               ASSIGN PRIORITY.
        ASSIGN,ATRIB(7) = 1;                          IDENTIFY BED DOWN PROJ.
        ASSIGN,ATRIB(2) = 0;
        ACT;
        GOON,1;
        ACT,,.85,M1;                                  FACILITY REQUIREMENT
  ;                                                   PLAN ADEQUATE TO START
  ;                                                   PROGRAMMING.
        ACT,,.15;                                     FACILITY REQUIREMENT
  ;                                                   PLAN (FRP) INADEQUATE.
        GOON,1;
        ACT/2,UNFRM(140,185),,M2;                     FRP REVISED.
    M1  GOON,1;
```

```
        ACT,,.95,M2;                          95% HAVE CONSTRUCTION
        ACT,,.05;                             SITE IDENTIFIED.
        ASSIGN,ATRIB(2) = TNOW;
        AWAIT(2),BASE/1;                      WAITING FOR SITE TO
        ACT/1,RNORM(90,50,1);                 BE SELECTED.
        FREE, BASE/1;
        ASSIGN,ATRIB(2) = TNOW - ATRIB(2);    TIME SITE ASSIGNED.
M2      ASSIGN,ATRIB(1) = TNOW;
        AWAIT(1),REQ/1;                       ASSEMBLE SITE SURVEY
        AWAIT(9),BDEE/1;                      TEAM.
        AWAIT(52),MPROG/1;
        ACT/3,UNFRM(4,14);                    SURVEY AT SELECTED
        FREE,BDEE/1;                          BASE.
        FREE,MPROG/1;
        ACT/4,UNFRM(30,50);                   PREPARE 1391'S AND
;                                             PROJECT BOOKLETS (PB).
        FREE,REQ/1;
        ACT,,,M3;
M2A     ASSIGN,ATRIB(7) = 4;                  IDENTIFY RETURNED
;                                             PROJECTS.
M3      AWAIT(3),MPROG/1;                     MAJCOM PROGRAMMER
        ACT/5,UNFRM(3,10);                    MAJCOM REVIEW.
        FREE,MPROG/1;                         MAJCOM PROGRAMMER
        ACT/6,UNFRM(7,30);                    REVIEW AND COORDINATION.
        AWAIT(4),REQ/1;                       BASE PROGRAMMER
        ACT/7,EXPON(5,3);                     REVISE PB'S
        FREE,REQ/1;
        AWAIT(5),MPROG/1;
        ACT/8,UNFRM(10,16);                   MAJCOM REVIEWS AND
;                                             PREPARES FOR TRANS-
        FREE,MPROG/1;                         MITTAL TO HQ USAF/LEE.
        ACT,UNFRM(9,25);                      PRINTING AND TRAN-
        GOON,1;                               MITTAL TIME.
        ACT,,ATRIB(7).EQ.4,M7;
        ACT;
        COLCT,INT(1),TIME TO USAF;
        GOON,1;
        ACT,,,M7;
        CREATE,2,2,4;                         ALL NON-MODERNIZATION
        ACT,UNFRM(95,170);                    PROJECTS FROM OTHER
                                              MAJCOMS.
        ASSIGN,ATRIB(9) = UNFRM(0,4);         ASSIGN PRIORITY
        ASSIGN,ATRIB(7) = 2;                  IDENTIFY PROJS. FROM
;                                             OTHER MAJCOMS (NON-
        ACT,,,M7;                             MODERNIZATION).
        CREATE,0,0,4,250;
        ASSIGN,ATRIB(7) = 3;                  IDENTIFY MODERNIZATION
;                                             PROJECTS.
        ACT,,,M4;
;
        CREATE,1,10,4;                        ALL AF MODERNIZATION
```

```
        ASSIGN,ATRIB(7) = 3;                    PROJ. TO HQ USAF/LEE.
M4      GOON;
        AWAIT(6/250),OTHER,BALK(M9);            GATE OTHER CONTROL IS
        ASSIGN,ATRIB(4) = TNOW;                 IN SEGMENT A.
        ASSIGN,XX(6) = XX(6) + 1;
        ACT,UNFRM(115,130);
        GOON,1;
        ACT,,.80,M5;
        ACT,,.20;
        ASSIGN,ATRIB(9) = UNFRM(0,1);           20% ASSIGNED PRI. 1.
        ACT,,,M6;
M5      ASSIGN,ATRIB(9) = UNFRM(1,4);           ASSIGN REMAINING PRI.
M6      AWAIT(8),CALL;                          USAF CALL FOR MCP
        AWAIT(53),HOLD;                         MODERNIZATION PROJECTS
        ASSIGN,XX(2) = XX(2)+1;
        ACT,,,M8;                               GATE CONTROL,SEGMENT B
M7      AWAIT(10),CALLN;                        USAF CALL FOR NON-
        AWAIT(54),HOLD1;                        MODERNIZATION PROJECTS
;
;                                               IN NOVEMBER.
        ASSIGN,XX(15) = XX(15) + 1;
        ACT;                                    GATE CONTROL,SEGMENT B
M8      GOON,1;
        ACT/9,UNFRM(1,3);                       PREPARE FOR FACILITY
        GOON;                                   PANEL (F PANEL).
        ACT/10,UNFRM(2,4);                      F PANEL REVIEW.
        AWAIT(14),FRC;
        GOON,1;
        ACT,,ATRIB(7).EQ.4,M10;
        ACT;
        ASSIGN,ATRIB(5) = 0;
        GOON,1;
        ACT,,ATRIB(7).NE.1,M8A;
        ACT;
        GOON,1;
        ACT,,.75,M10;
        ACT,,.25,M8A;
M8A     GOON,1;
        ACT/11,,.65,M10;                        35% REJECTED.
        ACT,,.35;
        GOON,1;
        ACT/12,,ATRIB(7).EQ.1,M2A;              BED DOWN PROJECTS SENT
        ACT;                                    BACK TO MAJCOM.
M9      TERMINATE;
M10     GOON,1;
        ACT/13,,.73,M12;
        ACT/14,,.27;                            27% REQQUIRE TITLE 10,
        ASSIGN,ATRIB(8) = TNOW;                 2807 ACTION BY CONG.
        ASSIGN,XX(5) = XX(5)+1;
        AWAIT(16),CONG28;
        ACT/15,XX(1);                           STAFF 2807 ACTION
        GOON,1;
```

```
       ACT/16,,.95,M11;

       ACT/17,,.05;                                  CONGRESS HAS QUESTIONS
       GOON;                                         ON 5% OF PROJECTS.
       ACT/18,UNFRM(2,18);                           CONGRESSIONAL QUESTIONS
;                                                    RETURNED TO LEECC.
       AWAIT(17),LEECD/1;
       AWAIT(17),LEECD/1;
       ACT/19,UNFRM(3,10);                           PREPARE CONGRESSIONAL
;                                                    RESPONSE.
       FREE,LEECD/1;
M11    GOON;
       ACT/20,21;                                    WAIT 21 DAYS BEFORE
       ASSIGN,ATRIB(5) = TNOW - ATRIB(8);            RELEASE FROM CONGRESS.
M12    AWAIT(18),LEECD/1;
       ACT/21,UNFRM(0,1);                            ISSUE DESIGN INSTRUC-
       FREE,LEECD/1;                                 TION.
       GOON,1;
       AWAIT(21),DISTR;                              RELEASE OF DI(35%)
       GOON,1
       ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M13;
       ACT;
       GOON,1;
       ACT,,.20,M14;
       ACT/22,,.80;                                  PROJS. TO OTHER AFRCES.
       GOON;
       TERMINATE;
M13    COLCT,INT(1),DI ISSUED;
       ACT,,,M15;
M14    GOON;
M15    GOON,1;
       ACT/23,,.60,M16;
       ACT/24,,.40;
       AWAIT(22),REQ/1;                              BASE REVISE PB & 1391
       ACT/25,UNFRM(4,9);
       FREE,REQ/1;
M16    GOON;
       AWAIT(24),DI;                                 DESIGN INSTRUCTION TO
       ACT/26,UNFRM(3,6);                            COE ISSUED BY AFRCE.
       AWAIT(28),CORPS;
       ASSIGN,XX(7) = XX(7) + 1;                     COUNT PROJECTS.
       ASSIGN,ATRIB(8) = TNOW;
       ASSIGN,ATRIB(3) = XX(8);                      TIME FOR PREPARATION
;                                                    OF A DESIGN SCHEDULE.
       GOON;
       ACT/27,XX(9);                                 PREPARE COMMERCE BUS.
       GOON;                                         DAILY (CBD) AD.
       ACT/28,UNFRM(20,55);                          ADVERTIZE AND AWAIT AE
;                                                    RESPONSE.
       GOON;
       ACT/29,XX(10);                                AE SELECTION.
NA     GOON;
```

```
        ASSIGN,ATRIB(6) = TNOW - ATRIB(8);            CHECK TIME FOR PREP.
        ASSIGN,ATRIB(6) = ATRIB(6) - ATRIB(3);        OF COE FINAL DESIGN
        GOON,1;                                       SCHEDULE.
        ACT,,ATRIB(6).GE.0,NO;
        ACT,1,,NA;
NO      GOON,1;
        ACT/30,UNFRM(45,100);                         ISSUE NOTICE TO
;                                                     PROCEED TO AE.
        GOON;
        ACT/31,UNFRM(60,120);                         30% DESIGN COMPLETION.
        GOON,1;
        ACT,,ATRIB(7).NE.1.AND.ATRIB(7).NE.4,M17;     PROJS. OTHER THAN
        ACT/32,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4;       WEAPON SYS (WS) PROJS.
        GOON;
        COLCT,INT(1),TIME TO 30%;
        ACT,,,M18;
M17     GOON;
M18     ASSIGN,ATRIB(8) = TNOW - ATRIB(2);
        GOON,1;
        ACT,,ATRIB(2).EQ.0,M19;                       SEPERATE SITE DELAYED
        ACT,,ATRIB(2).NE.0;                           FROM THOSE WHICH HAD
        GOON;                                         SITE ASSIGNED.
        COLCT,INT(8),HOST BASE ASSIGNED;              SITE ASSIGNMENT STATS
M19     GOON,1;
        ACT,,ATRIB(5).EQ.0,M20;                       COLLECT STATS ONLY ON
        ACT,,ATRIB(5).NE.0;                           PROJS WHICH HAD DELAY.
        ASSIGN,ATRIB(5) = TNOW - ATRIB(5);
        COLCT,INT(5),CONG. DELAY;
M20     GOON;
        AWAIT(30),REV30;                              30% DESIGN REVIEW.
        ASSIGN,ATRIB(6) = XX(22);
        ACT/33,XX(21);                                PREPARE FOR DIST OF
        GOON,1;                                       30% DESIGN PACKAGE.
        ACT;
        ASSIGN,ATRIB(6) = 45 - TNOW + ATRIB(6);       TIME REMAINING FOR
        GOON,1;                                       30% REVIEW.
        ACT/34,,ATRIB(6).LE.0,M21;                    REVIEW TIME EXPIRED,
                                                      NO INPUT FROM AFRCE.
        ACT/35,,ATRIB(6).GT.0;                        REVIEW TIME REMAINING
        GOON;
        ACT/36,ATRIB(6);                              ACCOMPLISH REVIEW
M21     GOON,1;
        ACT,UNFRM(4,12);                              AFRCE COMPILES & GIVES
        GOON;                                         COMMENTS TO COE.
        ACT,UNFRM(1,2);                               DESIGN REVIEW MEETING
        GOON;
        ACT/37,UNFRM(5,15);                           COE COMPILES COMMENTS
        GOON;
        ACT,UNFRM(20,30);                             AE MAKES CHANGES &
        AWAIT(34),COE/1;                              RETURNS 35% DESIGN.
        ACT/38,UNFRM(2,5);                            COE FORWARDS TO AFRCE
```

```
        FREE,COE/1;
        AWAIT(35),AFRCE/1;                          AFRCE PREPARES 1178 &
        ACT,UNFRM(0,2);                             FORWARDS TO LEECC.
        FREE,AFRCE/1;
        AWAIT(37),CALL2;                            PROJECTS TO LEECC ON
                                                    1 AUGUST EACH YEAR.
        ACT/39,EXPON(60);                           OSD REVIEWS & INCLUDES
        GOON,1;                                     PROJECTS IN BUDGET.
        AWAIT(38),DI100;                            AUTHORIZED TO PROCEED
;                                                   WITH DESIGN TO 100%.
        ASSIGN,XX(3) = XX(3) + 1;
        GOON,1;
        ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M22;
        ACT;
        GOON,1;
        ACT/40,,.95,M22;                            95% TO CONGRESS IN
        ACT,,.05;                                   BUDGET, 5% CANCELLED
        TERMINATE;                                  PROJECT TERMINATED.
M22     GOON;
        ACT/41,UNFRM(165,185);                      CONG. REVIEWS & PASSES
        GOON,1;                                     MCP CONSTRUCTION BILL.
        ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M23;    WEAPONS SYS. PROJECTS
        ACT;                                        APPROVED FOR CONSTR.
        GOON,1;
        ACT,,.95,M23;                               95% INCLUDED IN MCP
        ACT,,.05;                                   BILL, 5% NOT INCLUDED
        TERMINATE;                                  CANCELL DESIGN & PROJ.
M23     GOON;
        ACT/42,UNFRM(60,80);                        CONGRESS/OSD PROVIDE
;                                                   FUNDING FOR CONSTR.
        GOON;
        ACT,UNFRM(2,3);                             NOTIFY MAJCOM'S ECT.
        GOON;                                       WHICH PROJECTS FUNDED.
        ACT/43,UNFRM(15,25);                        COMPLETE 95% DESIGN -
;                                                   REVIEW (ALL PARTIES).
        GOON;
        ACT,UNFRM(17,30);                           AE MAKES CHANGES.
        GOON;
        ACT/44,UNFRM(15,25);                        CORPS CHECKS DESIGN TO
;                                                   INSURE ALL COMMENTS
        AWAIT(42),NEWFY;                            WERE INCORPORATED.
        GOON;                                       START NEW FY 1 OCTOBER
        AWAIT(41),COE/1;
        ACT,EXPON(2);                               COE PREPARES CBD AD.
;                                                   FOR CONSTRUCTION.
        FREE,COE/1;
        ACT/45,UNFRM(35,50);                        ADVERTISE FOR PROJECT
        GOON;                                       CONSTRUCTION CONTRACT.
        ACT/46,UNFRM(4,10);                         CONTRACT AWARD.
        GOON;
        ACT,UNFRM(7,14);                            NOTICE TO PROCEED.
N       GOON;
```

```
        ACT/47,UNFRM(285,720);                    CONSTR. PERIOD ASSIGNED
        ASSIGN,ATRIB(3) = 0;
        GOON,1;
        ;
        ACT;
        GOON,1;
        ACT,,.40,M28;
        ACT,,.60;                                 CONSTRUCTION CHANGES
    M24 GOON,1;                                   ON 60% OF THE PROJECTS.
        ACT,,.80,M26;
        ACT,,.05,M27;
        ACT,,.15;                                 ON 15% OF THE PROJECTS
    M25 GOON,1;                                   CUMMULATIVE COST OF
        AWAIT(45),COE/1;                          CHANGES TOTAL BETWEEN
        ACT,UNFRM(1,3);                           5% & 15% OF THE PRO-
        FREE,COE/1                                GRAMMED AMOUNT.
        AWAIT(46),AFRCE/1;                        COE FORWARDS TO AFRCE.
        ACT,EXPON(2);
        FREE,AFRCE/1;                             AFRCE FROWARDS TO USAF.
        AWAIT(47),LEECC/1;                        USAF/LEECC PROCESSES
        ACT/49,UNFRM(5,7);                        REQUEST FOR FUNDS.
        FREE,LEECC/1;
        ASSIGN,ATRIB(3) = ATRIB(3) + 1;           CHANGES PER PROJECT.
        GOON,1;
        ACT,,.55,M28;                             55% NO FURTHER CHANGE.
        ACT,,.45;                                 45% GET MORE CHANGES.
        GOON,1;                                   AF AVE. IS 2.5 /PROJ.
        ACT,,ATRIB(3).EQ.2,M27;                   NEXT CHANGE WILL CAUSE
    ;                                             INCREASE TO EXCEED 25%
    ;                                             OF PA. THEREFORE REQ.
                                                  CONG.ACTION (GO TO M27)
        ACT,,,M25;                                CHECK FOR MORE CHANGES.
    M26 ASSIGN,ATRIB(3) = ATRIB(3) + 1;
        AWAIT(48),COE/1;
        ACT/48,UNFRM(5,7);                        CUMMULATIVE COST OF
        FREE,COE/1;                               CHANGES DOES NOT EX-
    ;                                             CEED 25% OF PROJECT
        GOON,1;                                   PROGRAMMED AMT. (PA).
        ACT,,.20,M28;                             20% RECIEVE NO MORE
        ACT,,.80;                                 CONSTR. CHANGES.
        GOON,1;                                   CHECK # OF CHANGES.
        ACT,,ATRIB(3).EQ.3,M28;                   ALLOW A MAXIMUM OF 3
        ACT,,,M24;                                CHANGES PER PROJECT.
    M27 GOON,1;
        ASSIGN,ATRIB(3) = ATRIB(3) + 1;           COUNT CHANGES PER PROJ.
        AWAIT(49),COE/1;
        ACT,UNFRM(1,2);                           CUMMULATIVE COST WITH
        FREE,COE/1;                               THIS CHANGE EXCEEDS
        AWAIT(50),AFRCE/1;                        25% OF THE PROJ. PA,
        ACT,EXPON(2);                             AFRCE FORWARDS TO HQ.
        FREE,AFRCE/1;                             USAF/LEECC.
        AWAIT(51),LEECC/1;
```

```
     ACT,UNFRM(5,7);                              LEECC FORWARDS TO CONG.
     FREE,LEECC/1;
     ACT/50,UNFRM(45,60);                         CONGRESS REVIEWS AND
     GOON,1;                                      APPROVES ADDED FUNDS.
     ACT,,.65,M28;                                65% RECEIVE NO FURTHER
     ACT,,.35;                                    CHANGES.
     GOON,1;
     ACT,,ATRIB(3).GT.1,M28;                      MAX. OF 2 CHANGES PER
     ACT,,,M24;                                   PROJ. (AF AVE IS 2.5)
M28  ASSIGN,ATRIB(8) = TNOW - ATRIB(7);
     COLCT,INT(8),TYPE PROJECT,4,0,1;             TYPE OF PROJ.COMPLETED
     ASSIGN,ATRIB(3) = TNOW - ATRIB(3);
     COLCT,INT(3),CONSTR. CHANGES,3/0/1;          NUMBER OF CHANGES.
     GOON,1;
     ACT,,ATRIB(7).NE.1.AND.ATRIB(7).NE.4,M33; OTHER PROJECTS SORTED.
     ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4;
     COLCT,INT(1),TIME COMPLETE;                  CONSTR. COMPLETE TIME.
     ASSIGN,ATRIB(10) = ATRIB(10) + UNFRM(100,365) + 1825;
     ASSIGN,ATRIB(10) = TNOW - ATRIB(10);         IOC CALCULATED.
     GOON,1;
     ACT,,ATRIB(10).GT.0,M29;                     PROJ. COMPLETED LATE.
     ACT,,ATRIB(10).LT.0,M30;                     PROJ. COMPLETED EARLY.
     ACT,,ATRIB(10).EQ.0,M31;                     PROJECT ON TIME.
M29  ASSIGN,ATRIB(10) = 3;                        3 = MISSED IOC.(LATE)
     ACT,,,M32;
M30  ASSIGN,ATRIB(10) = 1;                        1 = PRIOR TO IOC.
     ACT,,,M32;
M31  ASSIGN,ATRIB(10) = 2;                        2 = READY AT IOC.
M32  GOON,1;
     ASSIGN,ATRIB(10) = TNOW - ATRIB(10);
     COLCT,INT(10),DELIVERY STATUS,3/0/1;         DELIVERY TIME STATS.
     GOON,1;
     ASSIGN,ATRIB(9) = TNOW - ATRIB(9);           CALCULATE PRIORITY.
     COLCT,INT(9),PRIORITY,4/0/1;                 BED DOWN PROJ.PRIORITY
     ACT,,,M34;
M33  GOON;
     ACT;
     GOON;
     ASSIGN,ATRIB(9) = TNOW - ATRIB(9);
     ACT;
M34  GOON,1;
     ENDNETWORK;                                  END OF SIMULATION.
INIT,0,5840;                                      SIMULATE 10 YEARS PLUS
;                                                 6 YEAR WARM-UP PERIOD.
MONTR,SUMRY,2190,365
MONTR,CLEAR,2190,365;                             COLLECT STATS. EVERY
FIN;                                              YEAR STARTING AT YR. 6.
```

The output from this model follows immediately. Refer to Appendix G for definition and explanation of SLAM Summary Report.

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/13/1985          RUN NUMBER 1 OF 1

CURRENT TIME .2190E+04
STATISTICAL ARRAYS CLEARED AT TIME .0000E+00

END OF WARM-UP PERIOD

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .404E+03 | .155E+03 | .383E+00 | .124E+03 | .879E+03 | 107 |
| TIME TO 30% | .617E+03 | .144E+03 | .233E+00 | .347E+03 | .105E+04 | 78 |
| HOST BASE ASSIGN | .651E+02 | .526E+02 | .808E+00 | .279E+02 | .102E+03 | 2 |
| CONG. DELAY | .754E+02 | .212E+02 | .282E+00 | .444E+02 | .256E+03 | 111 |
| TYPE PROJECT | .236E+01 | .841E+00 | .356E+00 | .100E+01 | .300E+01 | 94 |
| CONSTR. CHANGES | .131E+01 | .129E+01 | .984E+00 | .000E+00 | .300E+01 | 94 |
| TIME COMPLETE | .180E+04 | .214E+03 | .119E+00 | .136E+04 | .207E+04 | 22 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 22 |
| PRIORITY | .161E+01 | .116E+01 | .721E+00 | .755E-01 | .400E+01 | 22 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.39 | 1.682 | 5 | 1 |
| 2 | LEECC | 6 | 2.03 | 2.090 | 6 | 4 |
| 3 | REQ | 6 | 3.62 | 2.605 | 6 | 2 |
| 4 | BDEE | 7 | 2.51 | 2.153 | 7 | 0 |
| 5 | BASE | 1 | .09 | .288 | 1 | 0 |
| 6 | MDEE | 4 | 1.92 | 1.760 | 4 | 0 |
| 7 | MPROG | 5 | 1.99 | 1.834 | 5 | 0 |
| 8 | AFRCE | 9 | 5.19 | 3.495 | 9 | 2 |
| 9 | COE | 18 | 8.06 | 5.544 | 18 | 5 |

REMAINING STATISTICS FOR WARM-UP PERIOD NOT PRINTED

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL            BY BLAKE & MARCHBANKS

DATE 8/13/1985            RUN NUMBER 1 OF 1

CURRENT TIME .2555E+04
STATISTICAL ARRAYS CLEARED AT TIME .2190E+04

END OF YEAR 7

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .336E+03 | .131E+03 | .390E+00 | .177E+03 | .691E+03 | 12 |
| TIME TO 30% | .696E+03 | .189E+03 | .272E+00 | .422E+03 | .115E+04 | 41 |
| HOST BASE ASSIGN | .703E+02 | .000E+00 | .000E+00 | .703E+02 | .703E+02 | 1 |
| CONG. DELAY | .770E+02 | .159E+02 | .206E+00 | .549E+02 | .103E+03 | 22 |
| TYPE PROJECT | .240E+01 | .839E+00 | .349E+00 | .100E+01 | .400E+01 | 62 |
| CONSTR. CHANGES | .115E+01 | .129E+01 | .113E+01 | .000E+00 | .300E+01 | 62 |
| TIME COMPLETE | .202E+04 | .245E+03 | .121E+00 | .176E+04 | .250E+04 | 14 |
| DELIVERY STATUS | .143E+01 | .852E+00 | .596E+00 | .100E+01 | .300E+01 | 14 |
| PRIORITY | .195E+01 | .134E+01 | .685E+00 | .119E+00 | .373E+01 | 14 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.15 | 1.421 | 5 | 0 |
| 2 | LEECC | 6 | 2.16 | 1.988 | 6 | 5 |
| 3 | REQ | 6 | 3.41 | 2.522 | 6 | 0 |
| 4 | BDEE | 7 | 3.17 | 2.178 | 7 | 4 |
| 5 | BASE | 1 | .19 | .391 | 1 | 0 |
| 6 | MDEE | 4 | 2.62 | 1.857 | 4 | 4 |
| 7 | MPROG | 5 | 1.95 | 1.768 | 5 | 0 |
| 8 | AFRCE | 9 | 6.92 | 3.218 | 9 | 9 |
| 9 | COE | 18 | 12.92 | 6.102 | 18 | 18 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0055 |
| 7 | FRC | CLOSED | .0110 |
| 8 | DI | CLOSED | .0548 |
| 9 | DISTR | CLOSED | .0548 |
| 10 | CORPS | CLOSED | .0438 |
| 11 | REV30 | CLOSED | .0493 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .2443 |
| 14 | HOLD | OPEN | .9890 |
| 15 | HOLD1 | OPEN | .9890 |

**HISTOGRAM NUMBER 5**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 12  .194  .100E+01 +***********                                      +
 15  .242  .200E+01 +*************          C                         +
 33  .532  .300E+01 +***************************                    C +
  2  .032  .400E+01 +***                                              C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 62                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .240E+01 | .839E+00 | .349E+00 | .100E+01 | .400E+01 | 62 |

## **HISTOGRAM NUMBER 6**

### CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 31  .500  .000E+00 +*************************                        +
  7  .113  .100E+01 +******                        C                  +
  8  .129  .200E+01 +******                              C            +
 16  .258  .300E+01 +*************                                    C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 62                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .115E+01 | .129E+01 | .113E+01 | .000E+00 | .300E+01 | 62 |

## **HISTOGRAM NUMBER 7**

### TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .160E+04 +                                                 +
  0  .000  .170E+04 +                                                 +
  4  .286  .180E+04 +**************                                   +
  2  .143  .190E+04 +*******             C                            +
  1  .071  .200E+04 +****                    C                        +
  2  .143  .210E+04 +*******                        C                 +
  2  .143  .220E+04 +*******                               C          +
  0  .000  .230E+04 +                                      C          +
  2  .143  .240E+04 +*******                                      C   +
  0  .000  .250E+04 +                                             C   +
  1  .071  .260E+04 +****                                             C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 14                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .202E+04 | .245E+03 | .121E+00 | .176E+04 | .250E+04 | 14 |

**HISTOGRAM NUMBER 8**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 11  .786  .100E+01 +***************************************          +
  0  .000  .200E+01 +                                      C          +
  3  .214  .300E+01 +***********                                      C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 14                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .143E+01 | .852E+00 | .596E+00 | .100E+01 | .300E+01 | 14 |

**HISTOGRAM NUMBER 9**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  5  .357  .100E+01 +******************                               +
  2  .143  .200E+01 +*******                 C                        +
  2  .143  .300E+01 +*******                        C                 +
  5  .357  .400E+01 +******************                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 14                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .195E+01 | .134E+01 | .685E+00 | .119E+00 | .373E+01 | 14 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL                BY BLAKE & MARCHBANKS

DATE 8/13/1985                                   RUN NUMBER 1 OF 1

CURRENT TIME .2920E+04
STATISTICAL ARRAYS CLEARED AT TIME .2555E+04

END OF YEAR 8

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .356E+03 | .135E+03 | .380E+00 | .171E+03 | .780E+03 | 34 |
| TIME TO 30% | .585E+03 | .145E+03 | .247E+00 | .338E+03 | .911E+03 | 20 |
| HOST BASE ASSIGN | .689E+02 | .000E+00 | .000E+00 | .689E+02 | .689E+02 | 1 |
| CONG. DELAY | .790E+02 | .488E+01 | .618E-01 | .752E+02 | .849E+02 | 18 |
| TYPE PROJECT | .229E+01 | .825E+00 | .361E+00 | .100E+01 | .400E+01 | 94 |
| CONSTR. CHANGES | .157E+01 | .128E+01 | .815E+00 | .000E+00 | .300E+01 | 94 |
| TIME COMPLETE | .196E+04 | .202E+03 | .103E+00 | .163E+04 | .240E+04 | 22 |
| DELIVERY STATUS | .127E+01 | .703E+00 | .552E+00 | .100E+01 | .300E+01 | 22 |
| PRIORITY | .143E+01 | .886E+00 | .621E+00 | .319E-01 | .308E+01 | 22 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.54 | 1.799 | 5 | 2 |
| 2 | LEECC | 6 | 3.93 | 1.930 | 6 | 4 |
| 3 | REQ | 6 | 4.05 | 2.494 | 6 | 0 |
| 4 | BDEE | 7 | 2.12 | 2.078 | 6 | 3 |
| 5 | BASE | 1 | .00 | .000 | 1 | 0 |
| 6 | MDEE | 4 | 1.32 | 1.772 | 4 | 3 |
| 7 | MPROG | 5 | 2.03 | 1.929 | 5 | 1 |
| 8 | AFRCE | 9 | 4.32 | 3.489 | 9 | 8 |
| 9 | COE | 18 | 7.88 | 5.656 | 18 | 7 |

## **GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0164 |
| 7 | FRC | CLOSED | .0219 |
| 8 | DI | CLOSED | .1370 |
| 9 | DISTR | CLOSED | .0548 |
| 10 | CORPS | OPEN | .1073 |
| 11 | REV30 | CLOSED | .0301 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .4144 |
| 14 | HOLD | OPEN | .9781 |
| 15 | HOLD1 | OPEN | .9781 |

## **HISTOGRAM NUMBER 5**

### TYPE PROJECT

```
 OBS RELA  UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
   0 .000  .000E+00 +                                                 +
  21 .223  .100E+01 +***********                                      +
  26 .277  .200E+01 +**************          C                        +
  46 .489  .300E+01 +************************                        C+
   1 .011  .400E+01 +*                                                C
   0 .000    INF    +                                                 C
 ---                +    +    +    +    +    +    +    +    +    +    +
  94                0         20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .229E+01 | .825E+00 | .361E+00 | .100E+01 | .400E+01 | 94 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 30  .319  .000E+00 +****************                                 +
 15  .160  .100E+01 +********               C                         +
 14  .149  .200E+01 +*******                       C                  +
 35  .372  .300E+01 +******************                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 94                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .157E+01 | .128E+01 | .815E+00 | .000E+00 | .300E+01 | 94 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .160E+04 +                                                 +
  3  .136  .170E+04 +*******                                          +
  3  .136  .180E+04 +*******      C                                   +
  1  .045  .190E+04 +**             C                                 +
  7  .318  .200E+04 +****************               C                 +
  2  .091  .210E+04 +*****                              C             +
  2  .091  .220E+04 +*****                                   C        +
  3  .136  .230E+04 +*******                                        C +
  1  .045  .240E+04 +**                                               C
  0  .000  .250E+04 +                                                 C
  0  .000  .260E+04 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 22                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .196E+04 | .202E+03 | .103E+00 | .163E+04 | .240E+04 | 22 |

**HISTOGRAM NUMBER 8**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 19  .864  .100E+01 +*******************************************      +
  0  .000  .200E+01 +                                          C      +
  3  .136  .300E+01 +*******                                          C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 22                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .127E+01 | .703E+00 | .552E+00 | .100E+01 | .300E+01 | 22 |

**HISTOGRAM NUMBER 9**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  8  .364  .100E+01 +******************                               +
  8  .364  .200E+01 +******************                 C             +
  5  .227  .300E+01 +***********                                    C +
  1  .045  .400E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 22                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .143E+01 | .886E+00 | .621E+00 | .319E-01 | .308E+01 | 22 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL    BY BLAKE & MARCHBANKS

DATE 8/13/1985    RUN NUMBER 1 OF 1

CURRENT TIME .3285E+04
STATISTICAL ARRAYS CLEARED AT TIME .2920E+04

END OF YEAR 9

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .323E+03 | .605E+02 | .188E+00 | .214E+03 | .482E+03 | 23 |
| TIME TO 30% | .575E+03 | .125E+03 | .217E+00 | .500E+03 | .106E+04 | 21 |
| HOST BASE ASSIGN | .710E+02 | .120E+01 | .132E+00 | .630E+02 | .790E+02 | 3 |
| CONG. DELAY | .745E+02 | .624E+01 | .837E-01 | .673E+02 | .897E+02 | 29 |
| TYPE PROJECT | .220E+01 | .828E+00 | .376E+00 | .100E+01 | .400E+01 | 93 |
| CONSTR. CHANGES | .117E+01 | .129E+01 | .110E+01 | .000E+00 | .300E+01 | 93 |
| TIME COMPLETE | .190E+04 | .319E+03 | .168E+00 | .126E+04 | .238E+04 | 24 |
| DELIVERY STATUS | .150E+01 | .885E+00 | .590E+00 | .100E+01 | .300E+01 | 24 |
| PRIORITY | .189E+01 | .124E+01 | .656E+00 | .594E-01 | .391E+01 | 24 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.37 | 1.693 | 5 | 3 |
| 2 | LEECC | 6 | 3.35 | 2.219 | 6 | 6 |
| 3 | REQ | 6 | 3.46 | 2.719 | 6 | 0 |
| 4 | BDEE | 7 | 3.74 | 1.807 | 7 | 0 |
| 5 | BASE | 1 | .89 | .312 | 1 | 1 |
| 6 | MDEE | 4 | 3.26 | 1.448 | 4 | 0 |
| 7 | MPROG | 5 | 1.83 | 1.921 | 5 | 0 |
| 8 | AFRCE | 9 | 7.75 | 2.000 | 9 | 3 |
| 9 | COE | 18 | 10.70 | 3.424 | 18 | 8 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0219 |
| 8 | DI | OPEN | .0845 |
| 9 | DISTR | CLOSED | .0548 |
| 10 | CORPS | CLOSED | .0681 |
| 11 | REV30 | CLOSED | .0411 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .4009 |
| 14 | HOLD | OPEN | .9781 |
| 15 | HOLD1 | OPEN | .9781 |

**HISTOGRAM NUMBER 5**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 20  .215  .100E+01 +************                                     +
 38  .409  .200E+01 +*********************          C                 +
 31  .333  .300E+01 +******************                             C +
  4  .043  .400E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 93                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .220E+01 | .828E+00 | .376E+00 | .100E+01 | .400E+01 | 93 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 44  .473  .000E+00 +************************                         +
 15  .161  .100E+01 +********                       C                 +
  8  .086  .200E+01 +****                               C             +
 26  .280  .300E+01 +**************                                   C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 93                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .117E+01 | .129E+01 | .110E+01 | .000E+00 | .300E+01 | 93 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  4  .167  .160E+04 +********                                         +
  2  .083  .170E+04 +****       C                                     +
  2  .083  .180E+04 +****            C                                +
  3  .125  .190E+04 +******                C                          +
  3  .125  .200E+04 +******                      C                    +
  3  .125  .210E+04 +******                            C              +
  3  .125  .220E+04 +******                                  C        +
  2  .083  .230E+04 +****                                        C    +
  2  .083  .240E+04 +****                                             C
  0  .000  .250E+04 +                                                 C
  0  .000  .260E+04 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 24                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .190E+04 | .319E+03 | .168E+00 | .126E+04 | .238E+04 | 24 |

**HISTOGRAM NUMBER 8**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 18  .750  .100E+01 +**************************************           +
  0  .000  .200E+01 +                                     C           +
  6  .250  .300E+01 +*************                                    C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 24                 0         20        40        60        80      100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .150E+01 | .885E+00 | .590E+00 | .100E+01 | .300E+01 | 24 |

**HISTOGRAM NUMBER 9**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  7  .292  .100E+01 +***************                                  +
  6  .250  .200E+01 +*************             C                      +
  5  .208  .300E+01 +**********                           C           +
  6  .250  .400E+01 +*************                                    C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 24                 0         20        40        60        80      100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .189E+01 | .124E+01 | .656E+00 | .594E-01 | .391E+01 | 24 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL                BY BLAKE & MARCHBANKS

DATE 8/13/1985                                   RUN NUMBER 1 OF 1

CURRENT TIME .3650E+04
STATISTICAL ARRAYS CLEARED AT TIME .3285E+04

END OF YEAR 10

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .341E+03 | .000E+00 | .000E+00 | .341E+03 | .341E+03 | 2 |
| TIME TO 30% | .572E+03 | .823E+02 | .144E+00 | .434E+03 | .764E+03 | 18 |
| HOST BASE ASSIGN | .758E+02 | .000E+00 | .000E+00 | .758E+02 | .758E+02 | 1 |
| CONG. DELAY | .916E+02 | .716E+02 | .781E+00 | .605E+02 | .267E+03 | 22 |
| TYPE PROJECT | .222E+01 | .867E+00 | .390E+00 | .100E+01 | .400E+01 | 67 |
| CONSTR. CHANGES | .157E+01 | .128E+01 | .818E+00 | .000E+00 | .300E+01 | 67 |
| TIME COMPLETE | .202E+04 | .183E+03 | .906E-01 | .172E+04 | .230E+04 | 19 |
| DELIVERY STATUS | .163E+01 | .955E+00 | .585E+00 | .100E+01 | .300E+01 | 19 |
| PRIORITY | .175E+01 | .138E+01 | .790E+00 | .385E-01 | .391E+01 | 19 |

## **RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.19 | 1.470 | 5 | 5 |
| 2 | LEECC | 6 | 3.22 | 2.246 | 6 | 6 |
| 3 | REQ | 6 | 3.54 | 2.630 | 6 | 0 |
| 4 | BDEE | 7 | 2.69 | 2.042 | 7 | 3 |
| 5 | BASE | 1 | .09 | .290 | 1 | 0 |
| 6 | MDEE | 4 | 1.98 | 1.608 | 4 | 3 |
| 7 | MPROG | 5 | 2.10 | 1.867 | 5 | 1 |
| 8 | AFRCE | 9 | 5.44 | 3.124 | 9 | 5 |
| 9 | COE | 18 | 9.33 | 5.296 | 18 | 7 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0075 |
| 8 | DI | CLOSED | .1073 |
| 9 | DISTR | CLOSED | .0685 |
| 10 | CORPS | CLOSED | .0877 |
| 11 | REV30 | CLOSED | .0466 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .3710 |
| 14 | HOLD | CLOSED | .9925 |
| 15 | HOLD1 | CLOSED | .9925 |

**HISTOGRAM NUMBER 5**

TYPE PROJECT

```
OBS  RELA    UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 16  .239  .100E+01 +************                                     +
 23  .343  .200E+01 +*****************                C               +
 25  .373  .300E+01 +******************                             C +
  3  .045  .400E+01 +**                                                C
  0  .000    INF    +                                                  C
---                 +    +    +    +    +    +    +    +    +    +    +
 67                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .222E+01 | .867E+00 | .390E+00 | .100E+01 | .400E+01 | 67 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 20  .299  .000E+00 +***************                                  +
 15  .224  .100E+01 +***********              C                       +
  6  .090  .200E+01 +****                          C                  +
 26  .388  .300E+01 +*******************                              C
  0  .000     INF   +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 67                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .157E+01 | .128E+01 | .818E+00 | .000E+00 | .300E+01 | 67 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .160E+04 +                                                 +
  0  .000  .170E+04 +                                                 +
  3  .158  .180E+04 +********                                         +
  3  .158  .190E+04 +********       C                                 +
  3  .158  .200E+04 +********               C                         +
  2  .105  .210E+04 +*****                       C                    +
  4  .211  .220E+04 +***********                           C          +
  3  .158  .230E+04 +********                                      C  +
  1  .053  .240E+04 +***                                              C
  0  .000  .250E+04 +                                                 C
  0  .000     INF   +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 19                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .202E+04 | .183E+03 | .906E-01 | .172E+04 | .230E+04 | 19 |

## **HISTOGRAM NUMBER 8**

### DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 13  .684  .100E+01 +**********************************               +
  0  .000  .200E+01 +                                  C              +
  6  .316  .300E+01 +****************                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 19                 0         20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .163E+01 | .955E+00 | .585E+00 | .100E+01 | .300E+01 | 19 |

## **HISTOGRAM NUMBER 9**

### PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  7  .368  .100E+01 +******************                               +
  4  .211  .200E+01 +************                    C                +
  3  .158  .300E+01 +*********                               C        +
  5  .263  .400E+01 +**************                                   C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 19                 0         20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .175E+01 | .138E+01 | .790E+00 | .385E-01 | .391E+01 | 19 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL    BY BLAKE & MARCHBANKS

DATE 8/13/1985    RUN NUMBER 1 OF 1

CURRENT TIME .4015E+04
STATISTICAL ARRAYS CLEARED AT TIME .3650E+04

END OF YEAR 11

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .340E+03 | .106E+03 | .311E+00 | .163E+03 | .701E+03 | 38 |
| TIME TO 30% | .601E+03 | .118E+03 | .196E+00 | .453E+03 | .921E+03 | 20 |
| HOST BASE ASSIGN | .312E+03 | .664E+02 | .213E+00 | .265E+03 | .359E+03 | 2 |
| CONG. DELAY | .810E+02 | .242E+01 | .299E-01 | .784E+02 | .831E+02 | 11 |
| TYPE PROJECT | .193E+01 | .842E+00 | .436E+00 | .100E+01 | .400E+01 | 57 |
| CONSTR. CHANGES | .133E+01 | .117E+01 | .878E+00 | .000E+00 | .300E+01 | 57 |
| TIME COMPLETE | .196E+04 | .224E+03 | .114E+00 | .172E+04 | .264E+04 | 22 |
| DELIVERY STATUS | .145E+01 | .858E+00 | .590E+00 | .100E+01 | .300E+01 | 22 |
| PRIORITY | .227E+01 | .118E+01 | .518E+00 | .167E+00 | .392E+01 | 22 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.61 | 1.831 | 5 | 4 |
| 2 | LEECC | 6 | 3.17 | 2.144 | 6 | 6 |
| 3 | REQ | 6 | 3.43 | 2.512 | 6 | 6 |
| 4 | BDEE | 7 | 3.00 | 1.669 | 7 | 0 |
| 5 | BASE | 1 | .14 | .344 | 1 | 0 |
| 6 | MDEE | 4 | 2.40 | 1.523 | 4 | 0 |
| 7 | MPROG | 5 | 2.09 | 1.748 | 5 | 1 |
| 8 | AFRCE | 9 | 4.99 | 2.681 | 9 | 3 |
| 9 | COE | 18 | 7.47 | 4.273 | 18 | 5 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0164 |
| 7 | FRC | OPEN | .0237 |
| 8 | DI | CLOSED | .1507 |
| 9 | DISTR | CLOSED | .0548 |
| 10 | CORPS | OPEN | .1155 |
| 11 | REV30 | CLOSED | .0301 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .4002 |
| 14 | HOLD | CLOSED | .9763 |
| 15 | HOLD1 | CLOSED | .9763 |

**HISTOGRAM NUMBER 5**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 20  .351  .100E+01 +******************                                +
 23  .404  .200E+01 +********************                 C           +
 12  .211  .300E+01 +***********                                    C +
  2  .035  .400E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 57                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .193E+01 | .842E+00 | .436E+00 | .100E+01 | .400E+01 | 57 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 19  .333  .000E+00 +*****************                                +
 13  .228  .100E+01 +***********                C                     +
 12  .211  .200E+01 +***********                           C          +
 13  .228  .300E+01 +***********                                      C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 57                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .133E+01 | .117E+01 | .878E+00 | .000E+00 | .300E+01 | 57 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .160E+04 +                                                 +
  0  .000  .170E+04 +                                                 +
  7  .318  .180E+04 +****************                                 +
  3  .136  .190E+04 +*******               C                          +
  6  .273  .200E+04 +**************                     C             +
  1  .045  .210E+04 +**                                    C          +
  3  .136  .220E+04 +*******                                     C    +
  1  .045  .230E+04 +**                                             C +
  0  .000  .240E+04 +                                               C +
  0  .000  .250E+04 +                                               C +
  0  .000  .260E+04 +                                               C +
  1  .045    INF    +**                                               C
---                 +    +    +    +    +    +    +    +    +    +    +
 22                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .196E+04 | .224E+03 | .114E+00 | .172E+04 | .264E+04 | 22 |

**HISTOGRAM NUMBER 8**

DELIVERY STATUS

```
OBS   RELA   UPPER
FREQ  FREQ   CELL LIM 0         20        40        60        80       100
                      +    +    +    +    +    +    +    +    +    +    +
  0   .000  .000E+00  +                                                 +
 17   .773  .100E+01  +***************************************          +
  0   .000  .200E+01  +                                      C          +
  5   .227  .300E+01  +***********                                      C
  0   .000    INF     +                                                 C
---                   +    +    +    +    +    +    +    +    +    +    +
 22                   0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .145E+01 | .858E+00 | .590E+00 | .100E+01 | .300E+01 | 22 |

**HISTOGRAM NUMBER 9**

PRIORITY

```
OBS   RELA   UPPER
FREQ  FREQ   CELL LIM 0         20        40        60        80       100
                      +    +    +    +    +    +    +    +    +    +    +
  0   .000  .000E+00  +                                                 +
  4   .182  .100E+01  +*********                                        +
  7   .318  .200E+01  +****************        C                        +
  2   .091  .300E+01  +*****                        C                   +
  9   .409  .400E+01  +********************                             C
  0   .000    INF     +                                                 C
---                   +    +    +    +    +    +    +    +    +    +    +
 22                   0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .227E+01 | .118E+01 | .518E+00 | .167E+00 | .392E+01 | 22 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL            BY BLAKE & MARCHBANKS

DATE 8/13/1985            RUN NUMBER 1 OF 1

CURRENT TIME .4380E+04
STATISTICAL ARRAYS CLEARED AT TIME .4015E+04

END OF YEAR 12

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .398E+03 | .199E+03 | .501E+00 | .180E+03 | .726E+03 | 5 |
| TIME TO 30% | .545E+03 | .123E+03 | .226E+00 | .361E+03 | .932E+03 | 23 |
| HOST BASE ASSIGN | .500E+02 | .000E+00 | .000E+00 | .500E+02 | .500E+02 | 1 |
| CONG. DELAY | .674E+02 | .133E+02 | .197E+00 | .550E+02 | .987E+02 | 23 |
| TYPE PROJECT | .236E+01 | .856E+00 | .363E+00 | .100E+01 | .400E+01 | 81 |
| CONSTR. CHANGES | .111E+01 | .121E+01 | .109E+01 | .000E+00 | .300E+01 | 81 |
| TIME COMPLETE | .193E+04 | .186E+03 | .964E-01 | .169E+04 | .239E+04 | 20 |
| DELIVERY STATUS | .150E+01 | .889E+00 | .592E+00 | .100E+01 | .300E+01 | 20 |
| PRIORITY | .223E+01 | .137E+01 | .614E+00 | .109E+00 | .370E+01 | 20 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.48 | 1.705 | 5 | 0 |
| 2 | LEECC | 6 | 3.05 | 2.460 | 6 | 6 |
| 3 | REQ | 6 | 3.45 | 2.399 | 6 | 0 |
| 4 | BDEE | 7 | 2.47 | 1.799 | 7 | 0 |
| 5 | BASE | 1 | .58 | .494 | 1 | 0 |
| 6 | MDEE | 4 | 1.82 | 1.569 | 4 | 0 |
| 7 | MPROG | 5 | 2.06 | 1.583 | 5 | 1 |
| 8 | AFRCE | 9 | 5.06 | 3.070 | 9 | 7 |
| 9 | COE | 18 | 9.69 | 6.085 | 18 | 10 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0164 |
| 7 | FRC | CLOSED | .0181 |
| 8 | DI | CLOSED | .1096 |
| 9 | DISTR | CLOSED | .0685 |
| 10 | CORPS | CLOSED | .0968 |
| 11 | REV30 | CLOSED | .0438 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .3565 |
| 14 | HOLD | OPEN | .9819 |
| 15 | HOLD1 | OPEN | .9819 |

**HISTOGRAM NUMBER 5**

TYPE PROJECT

```
 OBS RELA    UPPER
FREQ FREQ CELL LIM  0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
   0 .000  .000E+00 +                                                 +
  18 .222  .100E+01 +***********                                      +
  18 .222  .200E+01 +***********          C                           +
  43 .531  .300E+01 +***************************                     C+
   2 .025  .400E+01 +*                                                C
   0 .000    INF    +                                                 C
 ---                +    +    +    +    +    +    +    +    +    +    +
  81                0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .236E+01 | .856E+00 | .363E+00 | .100E+01 | .400E+01 | 81 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 38  .469  .000E+00 ************************                          +
 13  .160  .100E+01 *********                        C                +
 13  .160  .200E+01 *********                                  C      +
 17  .210  .300E+01 ***********                                       C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 81                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .111E+01 | .121E+01 | .109E+01 | .000E+00 | .300E+01 | 81 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .160E+04 +                                                 +
  1  .050  .170E+04 +**                                               +
  7  .350  .180E+04 ******************* C                             +
  1  .050  .190E+04 +**                    C                          +
  6  .300  .200E+04 ****************                      C            +
  1  .050  .210E+04 +**                                      C        +
  3  .150  .220E+04 ********                                        C +
  0  .000  .230E+04 +                                               C +
  1  .050  .240E+04 +**                                               C
  0  .000  .250E+04 +                                                 C
  0  .000  .260E+04 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 20                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .193E+04 | .186E+03 | .964E-01 | .169E+04 | .239E+04 | 20 |

**HISTOGRAM NUMBER 8**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 15  .750  .100E+01 +**************************************           +
  0  .000  .200E+01 +                                     C           +
  5  .250  .300E+01 +*************                                    C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 20                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .150E+01 | .889E+00 | .592E+00 | .100E+01 | .300E+01 | 20 |

**HISTOGRAM NUMBER 9**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  5  .250  .100E+01 +*************                                    +
  3  .150  .200E+01 +*******            C                             +
  3  .150  .300E+01 +*******                    C                     +
  9  .450  .400E+01 +**********************                           C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 20                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .223E+01 | .137E+01 | .614E+00 | .109E+00 | .370E+01 | 20 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL — BY BLAKE & MARCHBANKS

DATE 8/13/1985 — RUN NUMBER 1 OF 1

CURRENT TIME .4745E+04
STATISTICAL ARRAYS CLEARED AT TIME .4380E+04

END OF YEAR 13

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .291E+03 | .138E+03 | .473E+00 | .115E+03 | .691E+03 | 30 |
| TIME TO 30% | .505E+03 | .129E+03 | .255E+00 | .354E+03 | .887E+03 | 18 |
| HOST BASE ASSIGN | .165E+03 | .652E+02 | .395E+00 | .119E+03 | .211E+03 | 2 |
| CONG. DELAY | .632E+02 | .202E+02 | .319E+00 | .494E+02 | .907E+02 | 15 |
| TYPE PROJECT | .233E+01 | .780E+00 | .335E+00 | .100E+01 | .400E+01 | 79 |
| CONSTR. CHANGES | .108E+01 | .124E+01 | .115E+01 | .000E+00 | .300E+01 | 79 |
| TIME COMPLETE | .206E+04 | .210E+03 | .102E+00 | .185E+04 | .273E+04 | 15 |
| DELIVERY STATUS | .167E+01 | .976E+00 | .586E+00 | .100E+01 | .300E+01 | 15 |
| PRIORITY | .203E+01 | .145E+01 | .714E+00 | .599E-01 | .369E+01 | 15 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.35 | 1.693 | 5 | 5 |
| 2 | LEECC | 6 | 2.95 | 2.205 | 6 | 4 |
| 3 | REQ | 6 | 3.59 | 2.424 | 6 | 6 |
| 4 | BDEE | 7 | 3.26 | 2.120 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 2.56 | 1.810 | 4 | 0 |
| 7 | MPROG | 5 | 2.08 | 1.799 | 5 | 2 |
| 8 | AFRCE | 9 | 5.75 | 3.234 | 9 | 9 |
| 9 | COE | 18 | 9.75 | 5.365 | 18 | 12 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0055 |
| 7 | FRC | CLOSED | .0164 |
| 8 | DI | CLOSED | .0685 |
| 9 | DISTR | OPEN | .0414 |
| 10 | CORPS | CLOSED | .0548 |
| 11 | REV30 | CLOSED | .0356 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .3345 |
| 14 | HOLD | OPEN | .9836 |
| 15 | HOLD1 | OPEN | .9836 |

**HISTOGRAM NUMBER 5**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 14  .177  .100E+01 +*********                                        +
 26  .329  .200E+01 +****************        C                        +
 38  .481  .300E+01 +************************                        C+
  1  .013  .400E+01 +*                                                C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 79                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .233E+01 | .780E+00 | .335E+00 | .100E+01 | .400E+01 | 79 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 39  .494  .000E+00 +************************                         +
 13  .165  .100E+01 +********                        C                +
  9  .114  .200E+01 +******                                C          +
 18  .228  .300E+01 +***********                                      C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 79                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .108E+01 | .124E+01 | .115E+01 | .000E+00 | .300E+01 | 79 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .160E+04 +                                                 +
  0  .000  .170E+04 +                                                 +
  0  .000  .180E+04 +                                                 +
  3  .200  .190E+04 +**********                                       +
  3  .200  .200E+04 +**********         C                             +
  5  .333  .210E+04 +*****************                  C             +
  3  .200  .220E+04 +**********                                    C  +
  0  .000  .230E+04 +                                              C  +
  0  .000  .240E+04 +                                              C  +
  0  .000  .250E+04 +                                              C  +
  0  .000  .260E+04 +                                              C  +
  1  .067    INF    +***                                              C
---                 +    +    +    +    +    +    +    +    +    +    +
 15                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .206E+04 | .210E+03 | .102E+00 | .185E+04 | .273E+04 | 15 |

**HISTOGRAM NUMBER 8**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 10  .667  .100E+01 +*********************************                +
  0  .000  .200E+01 +                                C                +
  5  .333  .300E+01 +*****************                                C
  0  .000     INF   +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 15                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .167E+01 | .976E+00 | .586E+00 | .100E+01 | .300E+01 | 15 |

**HISTOGRAM NUMBER 9**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  6  .400  .100E+01 +********************                             +
  1  .067  .200E+01 +***                   C                          +
  1  .067  .300E+01 +***                       C                      +
  7  .467  .400E+01 +***********************                          C
  0  .000     INF   +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 15                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .203E+01 | .145E+01 | .714E+00 | .599E-01 | .369E+01 | 15 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL — BY BLAKE & MARCHBANKS

DATE 8/13/1985 — RUN NUMBER 1 OF 1

CURRENT TIME .5110E+04
STATISTICAL ARRAYS CLEARED AT TIME .4745E+04

END OF YEAR 14

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .447E+03 | .173E+03 | .386E+00 | .326E+03 | .747E+03 | 9 |
| TIME TO 30% | .586E+03 | .187E+03 | .319E+00 | .346E+03 | .102E+04 | 21 |
| HOST BASE ASSIGN | | | NO VALUES RECORDED | | | |
| CONG. DELAY | .738E+02 | .544E+01 | .736E-01 | .691E+02 | .798E+02 | 18 |
| TYPE PROJECT | .206E+01 | .782E+00 | .379E+00 | .100E+01 | .300E+01 | 84 |
| CONSTR. CHANGES | .148E+01 | .133E+01 | .901E+00 | .000E+00 | .300E+01 | 84 |
| TIME COMPLETE | .193E+04 | .166E+03 | .857E-01 | .157E+04 | .223E+04 | 23 |
| DELIVERY STATUS | .143E+01 | .843E+00 | .588E+00 | .100E+01 | .300E+01 | 23 |
| PRIORITY | .152E+01 | .122E+01 | .802E+00 | .493E-01 | .390E+01 | 23 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.18 | 1.481 | 5 | 5 |
| 2 | LEECC | 6 | 2.65 | 2.001 | 6 | 6 |
| 3 | REQ | 6 | 3.51 | 2.599 | 6 | 0 |
| 4 | BDEE | 7 | 2.00 | 1.810 | 6 | 0 |
| 5 | BASE | 1 | .14 | .342 | 1 | 0 |
| 6 | MDEE | 4 | 1.28 | 1.514 | 4 | 0 |
| 7 | MPROG | 5 | 1.91 | 1.820 | 5 | 0 |
| 8 | AFRCE | 9 | 4.73 | 3.839 | 9 | 0 |
| 9 | COE | 18 | 8.98 | 5.713 | 18 | 9 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0147 |
| 8 | DI | CLOSED | .0685 |
| 9 | DISTR | CLOSED | .0544 |
| 10 | CORPS | CLOSED | .0548 |
| 11 | REV30 | CLOSED | .0329 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .2772 |
| 14 | HOLD | CLOSED | .9853 |
| 15 | HOLD1 | CLOSED | .9853 |

**HISTOGRAM NUMBER 5**

TYPE PROJECT

```
OBS  RELA    UPPER
FREQ FREQ   CELL LIM 0         20        40        60        80        100
                     +    +    +    +    +    +    +    +    +    +    +
  0  .000   .000E+00 +                                                 +
 23  .274   .100E+01 +**************                                   +
 33  .393   .200E+01 +********************            C                +
 28  .333   .300E+01 +*****************                                C
  0  .000   .400E+01 +                                                 C
  0  .000        INF +                                                 C
---                  +    +    +    +    +    +    +    +    +    +    +
 84                  0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .206E+01 | .782E+00 | .379E+00 | .100E+01 | .300E+01 | 84 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 32  .381  .000E+00 +*******************                              +
 11  .131  .100E+01 +********                 C                       +
 10  .119  .200E+01 +*******                        C                 +
 31  .369  .300E+01 +******************                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 84                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .148E+01 | .133E+01 | .901E+00 | .000E+00 | .300E+01 | 84 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  1  .043  .160E+04 +**                                               +
  0  .000  .170E+04 + C                                               +
  5  .217  .180E+04 +*********** C                                    +
  4  .174  .190E+04 +*********           C                            +
  6  .261  .200E+04 +*************                    C               +
  2  .087  .210E+04 +****                                 C           +
  4  .174  .220E+04 +*********                                      C +
  1  .043  .230E+04 +**                                               C
  0  .000  .240E+04 +                                                 C
  0  .000  .250E+04 +                                                 C
  0  .000  .260E+04 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 23                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .193E+04 | .166E+03 | .857E-01 | .157E+04 | .223E+04 | 23 |

**HISTOGRAM NUMBER 8**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80      100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 18  .783  .100E+01 +***************************************          +
  0  .000  .200E+01 +                                      C          +
  5  .217  .300E+01 +***********                                      C
  0  .000    INF    +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 23                 0         20        40        60        80      100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .143E+01 | .843E+00 | .588E+00 | .100E+01 | .300E+01 | 23 |

**HISTOGRAM NUMBER 9**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80      100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 11  .478  .100E+01 +************************                         +
  4  .174  .200E+01 +*********                       C                +
  5  .217  .300E+01 +***********                               C      +
  3  .130  .400E+01 +*******                                          C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 23                 0         20        40        60        80      100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .152E+01 | .122E+01 | .802E+00 | .493E-01 | 390E+01 | 23 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL    BY BLAKE & MARCHBANKS

DATE 8/13/1985    RUN NUMBER 1 OF 1

CURRENT TIME .5475E+04
STATISTICAL ARRAYS CLEARED AT TIME .5110E+04

END OF YEAR 15

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .347E+03 | .880E+02 | .254E+00 | .185E+03 | .567E+03 | 22 |
| TIME TO 30% | .564E+03 | .844E+02 | .150E+00 | .384E+03 | .758E+03 | 22 |
| HOST BASE ASSIGN | .494E+02 | .000E+00 | .000E+00 | .494E+02 | .494E+02 | 1 |
| CONG. DELAY | .602E+02 | .168E+02 | .279E+00 | .457E+02 | .790E+02 | 30 |
| TYPE PROJECT | .224E+01 | .875E+00 | .391E+00 | .100E+01 | .400E+01 | 63 |
| CONSTR. CHANGES | .146E+01 | .127E+01 | .868E+00 | .000E+00 | .300E+01 | 63 |
| TIME COMPLETE | .202E+04 | .173E+03 | .856E-01 | .179E+04 | .237E+04 | 18 |
| DELIVERY STATUS | .144E+01 | .856E+00 | .592E+00 | .100E+01 | .300E+01 | 18 |
| PRIORITY | .193E+01 | .135E+01 | .700E+00 | .114E-02 | .376E+01 | 18 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.54 | 1.824 | 5 | 5 |
| 2 | LEECC | 6 | 3.04 | 1.802 | 6 | 4 |
| 3 | REQ | 6 | 3.51 | 2.714 | 6 | 0 |
| 4 | BDEE | 7 | 2.44 | 2.036 | 6 | 0 |
| 5 | BASE | 1 | .05 | .218 | 1 | 0 |
| 6 | MDEE | 4 | 1.64 | 1.917 | 4 | 0 |
| 7 | MPROG | 5 | 1.90 | 1.948 | 5 | 0 |
| 8 | AFRCE | 9 | 4.55 | 3.936 | 9 | 9 |
| 9 | COE | 18 | 8.78 | 6.565 | 18 | 18 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NF'JFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | OPEN | .0126 |
| 7 | FRC | OPEN | .0189 |
| 8 | DI | CLOSED | .0822 |
| 9 | DISTR | CLOSED | .0411 |
| 10 | CORPS | CLOSED | .0658 |
| 11 | REV30 | CLOSED | .0329 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .3672 |
| 14 | HOLD | CLOSED | .9811 |
| 15 | HOLD1 | CLOSED | .9811 |

**HISTOGRAM NUMBER 5**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 16  .254  .100E+01 **************                                    +
 18  .286  .200E+01 ***************                     C             +
 27  .429  .300E+01 **********************                          C +
  2  .032  .400E+01 ***                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 63                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .224E+01 | .875E+00 | .391E+00 | .100E+01 | .400E+01 | 63 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 21  .333  .000E+00 +****************                                 +
 13  .206  .100E+01 +**********               C                       +
  8  .127  .200E+01 +******                         C                 +
 21  .333  .300E+01 +****************                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 63                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .146E+01 | .127E+01 | .868E+00 | .000E+00 | .300E+01 | 63 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .160E+04 +                                                 +
  0  .000  .170E+04 +                                                 +
  1  .056  .180E+04 +***                                              +
  5  .278  .190E+04 +**************  C                                +
  2  .111  .200E+04 +******               C                           +
  5  .278  .210E+04 +**************                     C             +
  0  .000  .220E+04 +                                   C             +
  4  .222  .230E+04 +***********                                   C  +
  1  .056  .240E+04 +***                                              C
  0  .000  .250E+04 +                                                 C
  0  .000  .260E+04 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 18                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .202E+04 | .173E+03 | .856E-01 | .179E+04 | .237E+04 | 18 |

**HISTOGRAM NUMBER 8**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 14  .778  .100E+01 +***************************************          +
  0  .000  .200E+01 +                                      C          +
  4  .222  .300E+01 +***********                                      C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 18                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .144E+01 | .856E+00 | .592E+00 | .100E+01 | .300E+01 | 18 |

**HISTOGRAM NUMBER 9**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  5  .278  .100E+01 +**************                                   +
  4  .222  .200E+01 +***********             C                        +
  4  .222  .300E+01 +***********                        C             +
  5  .278  .400E+01 +**************                                   C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 18                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .193E+01 | .135E+01 | .700E+00 | .114E-02 | .376E+01 | 18 |

## S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL        BY BLAKE & MARCHBANKS

DATE 8/13/1985        RUN NUMBER 1 OF 1

CURRENT TIME .5840E+04
STATISTICAL ARRAYS CLEARED AT TIME .5475E+04

END OF YEAR 16

### **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DI ISSUED | .328E+03 | .560E+02 | .171E+00 | .180E+03 | .401E+03 | 19 |
| TIME TO 30% | .570E+03 | .708E+02 | .124E+00 | .367E+03 | .647E+03 | 19 |
| HOST BASE ASSIGN | .183E+02 | .000E+00 | .000E+00 | .183E+02 | .183E+02 | 1 |
| CONG. DELAY | .718E+02 | .403E+01 | .561E-01 | .683E+02 | .832E+02 | 17 |
| TYPE PROJECT | .208E+01 | .862E+00 | .414E+00 | .100E+01 | .400E+01 | 73 |
| CONSTR. CHANGES | .155E+01 | .127E+01 | .820E+00 | .000E+00 | .300E+01 | 73 |
| TIME COMPLETE | .192E+04 | .181E+03 | .940E-01 | .162E+04 | .233E+04 | 24 |
| DELIVERY STATUS | .133E+01 | .761E+00 | .571E+00 | .100E+01 | .300E+01 | 24 |
| PRIORITY | .199E+01 | .899E+00 | .452E+00 | .388E+00 | .381E+01 | 24 |

### **RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.20 | 1.479 | 5 | 0 |
| 2 | LEECC | 6 | 3.14 | 1.971 | 6 | 3 |
| 3 | REQ | 6 | 3.50 | 2.626 | 6 | 0 |
| 4 | BDEE | 7 | 2.62 | 2.106 | 7 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 4 | 1.98 | 1.74 | 4 | 0 |
| 7 | MPROG | 5 | 2.08 | 2.064 | 5 | 0 |
| 8 | AFRCE | 9 | 5.03 | 2.990 | 9 | 4 |
| 9 | COE | 18 | 8.03 | 4.746 | 18 | 2 |

## **GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0093 |
| 7 | FRC | CLOSED | .0102 |
| 8 | DI | CLOSED | .1233 |
| 9 | DISTR | CLOSED | .0548 |
| 10 | CORPS | CLOSED | .0986 |
| 11 | REV30 | CLOSED | .0329 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .3109 |
| 14 | HOLD | OPEN | .9898 |
| 15 | HOLD1 | OPEN | .9898 |

## **HISTOGRAM NUMBER 5**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 23  .315  .100E+01 +****************                                 +
 22  .301  .200E+01 +***************               C                  +
 27  .370  .300E+01 +******************                              C+
  1  .014  .400E+01 +*                                                C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 73                 0         20        40        60        80       100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .208E+01 | .862E+00 | .414E+00 | .100E+01 | .400E+01 | 73 |

**HISTOGRAM NUMBER 6**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 23  .315  .000E+00 +****************                                 +
 13  .178  .100E+01 +*********               C                        +
 11  .151  .200E+01 +********                       C                 +
 26  .356  .300E+01 +******************                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 73                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .155E+01 | .127E+01 | .820E+00 | .000E+00 | .300E+01 | 73 |

**HISTOGRAM NUMBER 7**

TIME COMPLETE

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .160E+04 +                                                 +
  2  .083  .170E+04 +****                                             +
  4  .167  .180E+04 +********   C                                     +
  7  .292  .190E+04 +***************           C                      +
  4  .167  .200E+04 +********                          C              +
  1  .042  .210E+04 +**                                   C           +
  5  .208  .220E+04 +**********                                     C +
  0  .000  .230E+04 +                                               C +
  1  .042  .240E+04 +**                                               C
  0  .000  .250E+04 +                                                 C
  0  .000  .260E+04 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 24                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME COMPLETE | .192E+04 | .181E+03 | .940E-01 | .162E+04 | .233E+04 | 24 |

## **HISTOGRAM NUMBER 8**

### DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 20  .833  .100E+01 +*****************************************        +
  0  .000  .200E+01 +                                         C       +
  4  .167  .300E+01 +********                                         C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 24                 0         20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .133E+01 | .761E+00 | .571E+00 | .100E+01 | .300E+01 | 24 |

## **HISTOGRAM NUMBER 9**

### PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  3  .125  .100E+01 +******                                           +
 10  .417  .200E+01 +*********************     C                      +
  8  .333  .300E+01 +*****************                          C     +
  3  .125  .400E+01 +******                                           C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 24                 0         20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .199E+01 | .899E+00 | .452E+00 | .388E+00 | .381E+01 | 24 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL　　　　　BY BLAKE & MARCHBANKS

DATE 8/13/1985　　　　　RUN NUMBER 1 OF 1

CURRENT TIME .5840E+04
STATISTICAL ARRAYS CLEARED AT TIME .5840E+04

END OF SIMULATION RUN

## Appendix E: Simulation Two - Conceptual Model With Changes in the Design Phase

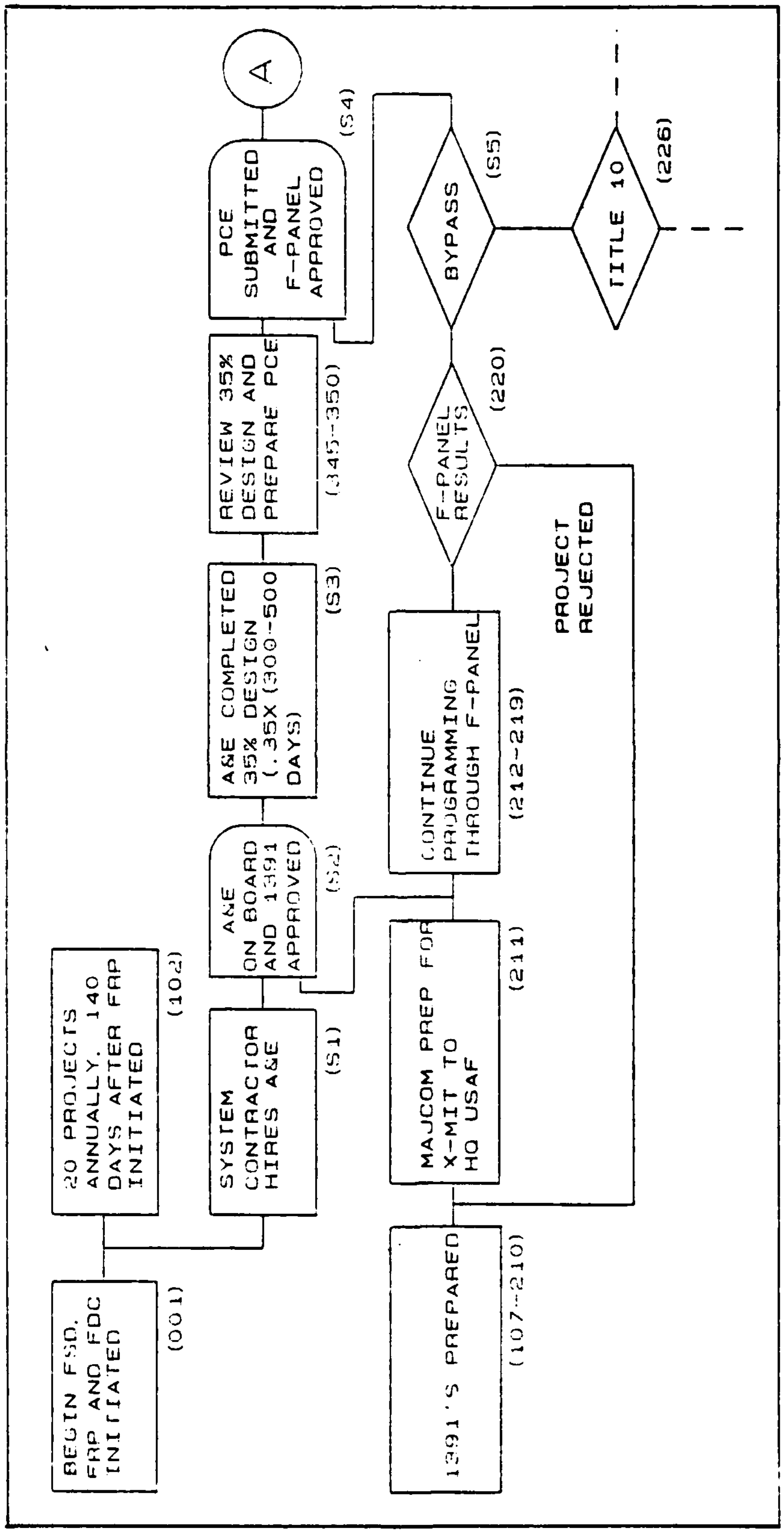


Figure 10. Simulation Two - System Contractor Produces Facility Designs

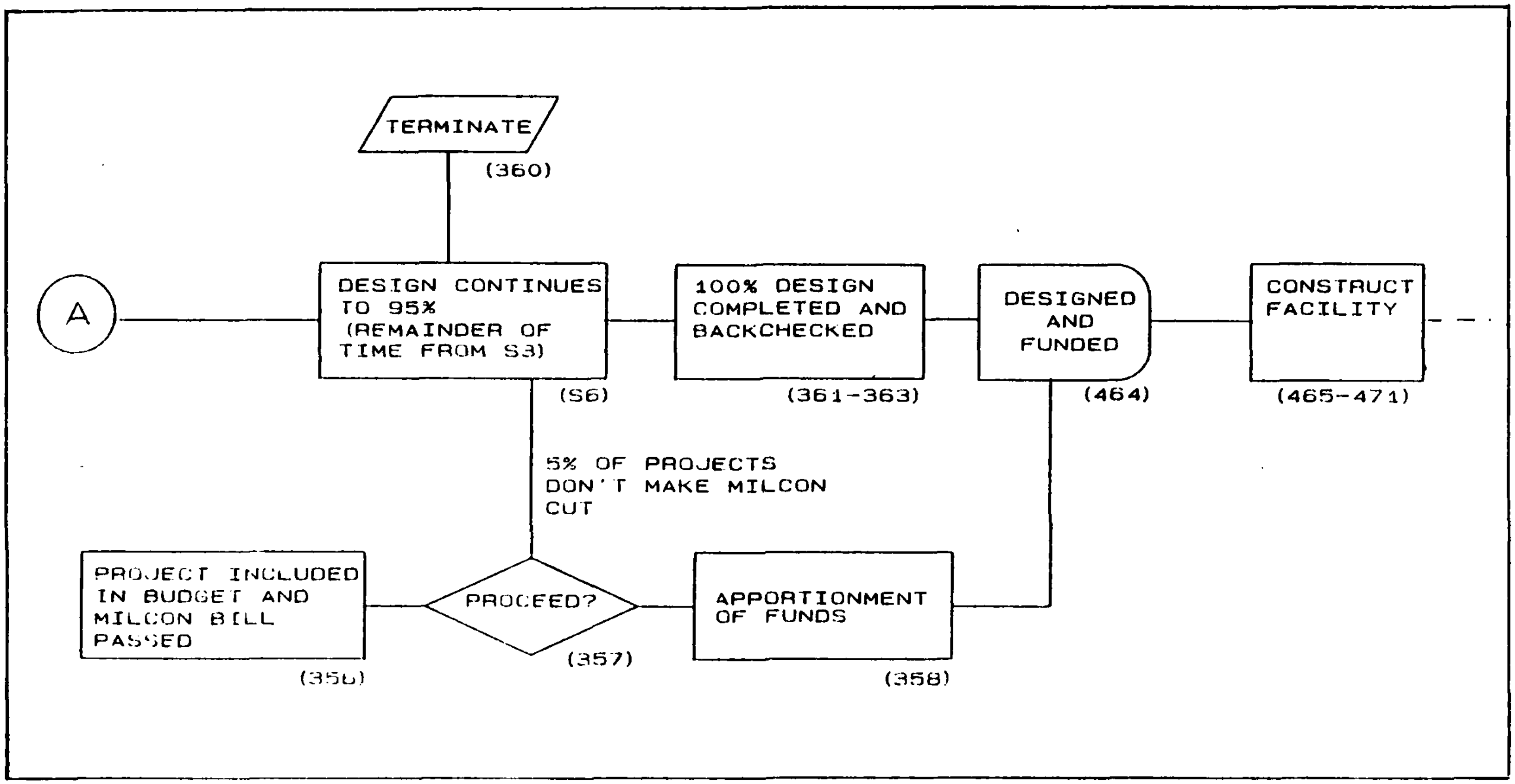


Figure 11. Simulation Two - System Contractor Produces Facility Designs

## Appendix F: Simulation Model with System Contractor Accomplishing Facility Design

```
*******************************************************************************
*                                                                             *
*                                                                             *
*        INTEGRATED SYSTEMS AND FACILITIES ACQUISITION MODEL                  *
*                                                                             *
* SIMULATING WEAPON SYSTEM CONTRACTOR RESPONSIBLE FOR FACILITY DESIGN         *
*                                                                             *
*                              USING                                          *
*                                                                             *
*                   * * * * * * * * * * * * * * *                             *
*                   *                           *                             *
*                   *    SLAM II VERSION 2.1    *                             *
*                   *                           *                             *
*                   * * * * * * * * * * * * * * *                             *
*                                                                             *
*                                                                             *
*                                                                             *
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*                                                                             *
*******************************************************************************
```

ECHO OF INPUT PROGRAM

```
GEN,BLAKE & MARCHBANKS,FACILITY MODEL,8/19/85,1,Y,Y,Y,Y,Y,1,72;
LIMITS,62,11,2000;
INTLC,XX(1)=0,XX(2)=0,XX(3)=0,XX(4)=0,XX(5)=0,XX(6)=0,XX(7)=0;
INTLC,XX(9)=0,XX(10)=0,XX(13)=0,XX(14)=0,XX(15)=0,XX(88)=0,XX(99)=1;
PRIORITY/1,LVF(9),/2,LVF(9)/3,LVF(9)/4,LVF(9)/5,LVF(9)/8,LVF(9);
PRIORITY/9,LVF(9)/10,LVF(9)/14,LVF(9)/17,LVF(9)/18,LVF(9);
PRIORITY/21,LVF(9)/22,FIFO/24,LVF(9)/28,LVF(9)/30,LVF(9)/31,HVF(7);
PRIORITY/32,HVF(7)/33,HVF(7)/34,LVF(9)/35,LVF(9)/37,LVF(9)/38,LVF(9);
PRIORITY/41,LVF(9)/42,LVF(9)/45,LVF(9)/46,LVF(9)/47,LVF(9)/48,LVF(9);
PRIORITY/49,LVF(9)/50,LVF(9)/51,LVF(9)/52,LVF(9)/55,LVF(9)/56,LVF(9);
PRIORITY/57,LVF(9)/58,LVF(9);
;
;
;   EXPLANATION OF FILE PRIORITIES:
;
;      PRIORITIZED FILES, LVF(9)= LOWEST VALUE FIRST BASED ON VALUE
; RECORDED IN FILE NO. 9.  FILE 9 IS THE ASSIGNED PROJECT PRIORITY.
; HVF(7)= HIGHEST VALUE FIRST BASED ON VALUE IN FILE NUMBER 7. FILE
; 7 RECORDS THE NUMBER OF RESOURCE UNITS REQUIRED FOR AN ACTIVITY.
; THUS IT WILL PROCESS THOSE REQUIRING THE MOST RESOURCES FIRST.
; FIFO= FIRST IN FIRST OUT.  ALL FILES NOT OTHERWISE SPECIFIED USE
; FIFO PROCESSING.
;
;
;             ***************************************
;             *                                     *
;             *  INTEGRATED SYSTEMS AND FACILITIES  *
;             *         ACQUISITION MODEL           *
;             *                                     *
;             *         TIME UNIT IS ONE DAY        *
;             *       DAY 1, 366, ECT. =  1 JAN     *
;             *                                     *
;             *         REV H - 15 AUG 85           *
;             * (SYSTEM CONTRACTOR AS FAC. DESIGNER) *
;             ***************************************
;
;
;
;       RESOURCE STATEMENTS REPRESENT INDIVIDUALS ASSIGNED TO THE
; VARIOUS ORGANIZATIONS INVOLVED IN THE ACQUISITION OF AIR FORCE
; FACILITIES UNDER THE MILITARY CONSTRUCTION PROGRAM.
;       THE NUMBER IN PARENTHESIS REPRESENTS THE NUMBER OF PEOPLE
; ASSIGNED TO THE FUNCTIONAL AREA REPRESENTED.  THE OTHER NUMBERS
; REPRESENT THE FILES IN WHICH PROJECTS ARE AWAITING ACTION BY THE
; ORGANIZATION WHERE THE RESOURCE IS EMPLOYED.  THE RESOURCE WILL
; CONSIDER THE ORDER OF THE FILE LIST WHEN SELECTING A PROJECT TO
; SERVICE NEXT.
;
;
```

```
;
;
;
NETWORK;
     RESOURCE/LEECD(5),17,7,43,15,36,13,11,18;  AIR STAFF, PROGRAMS.
     RESOURCE/LEECC(6),40,39,47,51;          AIR STAFF, CONSTRUCTION.
     RESOURCE/REQ(6),4,22,1;                 BASE PROGRAMMERS & ENGRS.
     RESOURCE/BDEE(7),33,9;                  BASE ENGINEERING.
     RESOURCE/BASE(1),2;                     MAJCOM MISSION PLANNERS.
     RESOURCE/MDEE(5),32;                    MAJCOM, ENGINEERING.
     RESOURCE/MPROG(6),5,20,52,3;            MAJCOM PROGRAMMERS
     RESOURCE/AFRCE(9),19,35,31,23,12,46,55,58,50;  AFRCE PROJECT
                                                       MANAGERS (PM).
     RESOURCE/COE(18),26,27,29,34,41,25,48,49,56,57,45;  CORPS OF
;                                                  ENGINEERS (COE) PMs.
;
;       GATES ARE USED TO CONTROL THE FLOW OF PROJECTS THROUGH THE
; MCP PROCESS.  PROJECTS STOP AT CLOSED GATES AND ACCUMULATE IN
; THE FILE ASSIGNED TO THE GATE.  WHEN THE GATE IS OPEN PROJECTS
; ARE ALLOWED TO PASS.  EITHER ALL OF THE PROJECTS IN THE FILE OR
; A SPECIFIED NUMBER MAY PASS BEFORE THE GATE CLOSES.  GATE OPER-
; ATION IS CONTROLLED BY THE MODEL SEGMENTS LISTED PRIOR TO THE
; MAIN PROGRAM.  GATE OPENING IS DEPENDENT EITHER ON THE PASSAGE
; OF TIME OR THE ACCUMULATION OF A DEFINED NUMBER OF PROJECTS.
     GATE/CALL,CLOSED,8;                      PROJECT CALL FOR ALL
                                              MODERNIZATION PROJS.
     GATE/CALLN,CLOSED,10;                    PROJECT CALL FOR ALL
;                                             NON-MODERNIZATION PROJ.
;                                             --1 NOV XX.
     GATE/NEWFY,CLOSED,42;                    NEW FY, 1 OCT XX.
     GATE/NEED,CLOSED,44;                     IDENTIFY REQ.
     GATE/OTHER,CLOSED,6;                     PROJS. OTHER MAJCOMS.
     GATE/CONG28,CLOSED,16;                   HOLD FOR TITLE 10.
     GATE/FRC,CLOSED,14;                      PUT IN GROUPS OF 5.
     GATE/DI,CLOSED,24;                       WAITING FOR DI.
     GATE/DISTR,CLOSED,21;                    WAITING AT AFRCE.
     GATE/CORPS,CLOSED,28;                    WAITING FOR COE PM.
     GATE/REV30,CLOSED,30;                    30% PROJ REVIEW.
     GATE/CALL2,CLOSED,37;                    PROJS TO CONG. ABOUT
;                                             1 JANUARY EACH YEAR.
     GATE/DI100,CLOSED,38;                    PROJECTS SURVIVES THE
;                                             F-PANEL.  COE NOTIFY
;                                             AE TO CONTINUE DESIGN.
     GATE/HOLD,OPEN,53;
     GATE/HOLD1,OPEN,54;
;
;
;      MODEL SEGMENT A       ** RELEASE PROJECTS FOR PROGRAMMING **
;
;
;
;
```

```
        CREATE,,40,,1;
A1      GOON;
        ASSIGN,ATRIB(1) = TNOW;
A1A     OPEN,NEED,1;                              FACILITY REQUIREMENTS
        ASSIGN,XX(88) = TNOW + UNFRM(70,99);      PLAN (FRP) IS PRODUCED
        GOON,1;                                   EVERY 365 DAYS.  EACH
        ACT,,XX(4).GE.20,A2;                      PLAN IDENTIFIES A NEED
        ACT,1,,A1A;                               FOR 20 NON-MODERNIZA-
;                                                 TION PROJECTS.
;
A2      CLOSE,NEED;
        ASSIGN,XX(4) = 0;                         PROJECT COUNTER.
        ASSIGN,ATRIB(1) = ATRIB(1) + 365 - TNOW;
        ACT,ATRIB(1),,A1 ;                        RECYCLE TO STATEMENT
;                                                 A1 EVERY 365 DAYS.
;
;
        CREATE,365,45;
        ACT;
A3      ASSIGN,ATRIB(1) = TNOW;
A4      GOON;
A4A     OPEN,OTHER,1;                             RELEASE 250 PROJECTS
        ACT,,XX(6).GE.250,A5 ;                    FROM OTHER MAJCOMS
        ACT,1,,A4 ;                               EACH YEAR.
A5      CLOSE,OTHER;
        ASSIGN,XX(6) = 0;
A6      GOON,1;
        ACT,,TNOW - ATRIB(1).GE.165,A7;           CALL OCCURS IN AUGUST
        ACT/90,2,,A6;                             FOR THE SUBMISSION OF
A7      OPEN,CALL2;                               PROJS. WITH 35% DESIGN
;                                                 COMPLETE FOR SUBMISSION
;                                                 TO CONGRESS ON 1 JAN.
        AWAIT(36),LEECD/2;                        WAIT FOR 2 STAFFERS.
        ACT,90;                                   ACCEPT PROJECTS FOR
A8      CLOSE,CALL2;                              NEXT 60 DAYS.
        FREE,LEECD/2;
        GOON;
        TERMINATE;
;
;
;
;
;         MODEL SEGMENT B          ** AIR STAFF PROJECT CALL **
;
;
;
;
        CREATE,,180,,1;                           INITIALIZE AT DAY 180.
B0      GOON,2;                                   1 JULY EACH YEAR.
        ACT,,,B8;
        ACT;
```

```
B1  OPEN,CALL;                             USAF CALL FOR PROJS
    ASSIGN,ATRIB(1) = TNOW;                (MODERNIZATION ONLY).
B2  AWAIT(7),LEECD/1;
    ACT,30;                                MAJCOM SUBMISSION PER.
B3  CLOSE,CALL;                            SUBMISSION PERIOD OVER.
    ASSIGN,ATRIB(1) = TNOW - ATRIB(1);     CALCULATE EXPIRED TIME.
    GOON,2;
    ACT,,,B6;
    ACT;
B4  GOON,1;
    ACT,,NNACT(10).EQ.0,B5;
    ACT,1,,B4;
B5  FREE,LEECD/1;                          RELEASE LEECD STAFFER.
    TERMINATE;
B6  GOON,1;
    ACT,90 - ATRIB(1);                     1 OCT XX--BEGIN NEW
    OPEN,NEWFY;                            FY FOR FUNDING.
    ACT/91,30;                             1 NOV XX--CALL FOR
    OPEN,CALLN;                            NON-MODERNIZATION
    GOON;                                  PROJECTS BY USAF.
    AWAIT(43),LEECD/1;                     LEECD STAFF PROJECTS.
    ACT,60;
    CLOSE,NEWFY;
    CLOSE,CALLN;
B7  GOON,1;
    ACT,,NNACT(10).EQ.0,B5;
    ACT,1,,B7;
B8  GOON,1;
    ACT,365,,B0;                           RECYCLE TO STATEMENT
;                                          B0 EVERY 365 DAYS.
;
;
;
;      MODEL SEGMENT C          ** STAFF TITLE 10, 2807 ACTION **
;
;
;
;
    CREATE,,,,1;
C2  GOON,1;                                CHECK EVERY 30 DAYS FOR
    ACT,,NNQ(9).GE.5,C3;                   FIVE OR MORE PROJECTS
    ACT,30,,C2;                            REQUIRING CONG. ACTION.
C3  GOON,1;
    ACT,,NNQ(15).GT.0,C2;
    ACT,,NNQ(15).LE.0;
    AWAIT(15),LEECD/2;                     STAFF AT LEAST FIVE
    ASSIGN,XX(1) = UNFRM(21,45);           PROJECTS AT A TIME.
;                                          XX(1)= PROCESSING TIME.
    OPEN,CONG28;
    ACT/92,2;
C4  GOON,1;
    ACT,,NNQ(16).EQ.0,C5;
```

```
     ACT,1,,C4;
C5   CLOSE,CONG28,1;                                PROCESS UNTIL ALL
     ACT,,NNACT(20).EQ.0,C6;                        PROJECTS WAITING FOR
     ACT,1,,C5;                                     CONGRESSIONAL ACTION
C6   FREE,LEECD/2;                                  HAVE COMPLETED ACT/20
     ACT,,,C2;                                      IN MAIN PROGRAM.
;
;
;
;
;      MODEL SEGMENT D                   ** FACILITY PANEL ACTION **
;
;
;
;
     CREATE,,,,1;
D1   GOON,1;
     ACT,,NNQ(14).GT.0.AND.NNQ(14).EQ.XX(2),D3;
     ACT,,NNQ(14).GT.0.AND.NNQ(14).EQ.XX(15),D6;
     ACT,1,,D1;
D3   AWAIT(11)/LEECD/1;
     CLOSE,HOLD;                                    TEMPORARY DELAY WHILE
     CLOSE,HOLD1;                                   PROJS. ENTER FACILITY
D4   OPEN,FRC;                                      PANEL (F-PANEL).
     ACT,2;                                         F-PANEL CONVENES.
     GOON,1;
     ACT,,NNQ(14).EQ.0,D5;
     ACT,2,,D4;
D5   CLOSE,FRC;                                     END TEMPORARY DELAY.
     OPEN,HOLD;                            NOTE:    GATES HOLD & HOLD1 ARE
     OPEN,HOLD1;                                    USED IN FIRST 2 OR 3
     ASSIGN,XX(2) = 0;                              YEARS OF THE MODEL RUN.
     ACT,,,D7A;                                     THEY CONTINUE TO OPEN
D6   AWAIT(13),LEECD/1;                             & CLOSE THROUGHOUT THE
     CLOSE,HOLD;                                    SIMULATION PERIOD, BUT
     CLOSE,HOLD1;                                   DO NOT CAUSE DELAY OF
D6A  OPEN,FRC;                                      PROJECTS.  THEY ACT TO
     ACT,2;                                         ARTIFICIALLY CLOSE GATE
     GOON,1;                                        OTHER SHOULD IT BE OPEN
     ACT,,NNQ(14).EQ.0,D7;                          WHEN GATE FRC OPENS.
     ACT,1,,D6A;
D7   CLOSE,FRC;
     OPEN,HOLD;
     OPEN,HOLD1;
     ASSIGN,XX(15) = 0;
D7A  GOON,2;
     ACT,,,D1;
     ACT/93,5;
D8   GOON,1;                                        WHEN ALL PROJS. FINISH
     ACT,,NNACT(21).EQ.0,D9;                        ACTIVITY 21 IN THE MAIN
     ACT,1,,D8;                                     PROGRAM, THEN RELEASE
D9   FREE,LEECD/1;                                  LEECD STAFFER.
```

```
     TERMINATE;
     GOON;

;
;
;
;
;       MODEL SEGMENT E      ** DISTRIBUTE DESIGN INSTRUCTIONS **
;
;
;
;
     CREATE,30,30,3,,1;
E0   GOON,1;
     ASSIGN,ATRIB(5) = TNOW - ATRIB(3);
     GOON,1;
     ACT,,ATRIB(5).GE.16,E5A;
     ACT,1;
     GOON,1;
     ACT,,NNQ(21).GT.0.AND.NNQ(21).LE.10,E2;
     ACT,,NNQ(21).EQ.0,E0;
     ACT,,NNQ(21).GT.10,E1;
     ACT,,,E5A;
E1   ASSIGN,ATRIB(4) = 2;
     ACT,,,E3;
E2   ASSIGN,ATRIB(4) = 1;
E3   AWAIT(19/1),AFRCE/ATRIB(4),BALK(E5A);
     AWAIT(20/1),MPROG/ATRIB(4),BALK(E5)
     ACT/94;
     OPEN,DISTR,1;                             USAF DISTRIBUTES DI'S.
     ACT,,TNOW.GE.ATRIB(3) + 5,E4;
     ACT,5;
E4   CLOSE, DISTR;
     ACT,UNFRM(5,15);                          PROCESS DI
     FREE,MPROG/ATRIB(4);
E5   FREE,AFRCE/ATRIB(4);                      FREE AFRCE AND MAJCOM
E5A  TERMINATE;                                AFTER RECEIPT OF DI.
;
;      MODEL SEGMENT E1    ** 35% DESIGN BEING PROCESSED AT USAF **
;
;
     CREATE,,250,,1,1;
     ACT;
E6   ASSIGN,ATRIB(1) = TNOW;
E7   GOON,1;
     ACT,,NNQ(38).GT.0,E8;
     ACT,5,,E7;
E8   AWAIT(39),LEECC/1;                        WAIT FOR LEECC
     ASSIGN,ATRIB(3) = 1;                      STAFFER.
     ACT/95;
E9   OPEN,DI100;                               ISSUE APPROVAL TO
     GOON,1;                                   PROCEED WITH DESIGN.
```

```
    ACT,,XX(3).GT.0.AND.XX(3).LE.5,E13;
    ACT,,XX(3).GT.5.AND.XX(3).LE.10,E10;
    ACT,,XX(3).GT.10,E11;
    ACT,5,,E9;
E10 ASSIGN,ATRIB(3) = 2;                          INCREASE REQUIREMENT
    ACT,,,E12;                                    FOR LEECC STAFF BY 1.
E11 ASSIGN,ATRIB(3) = 3;                          INCREASE REQUIREMENT
    ACT,,,E12;                                    FOR LEECC STAFF BY 2.
E12 ASSIGN,ATRIB(4) = ATRIB(3) - 1;               INCREASED STAFFING
    AWAIT(40),LEECC/ATRIB(4);                     BASED ON # OF PROJECTS
E13 GOON;                                         RECORDED IN XX(3).
    ACT,2;
    CLOSE,DI100;                                  RELEASE COMPLETED.
    ASSIGN,XX(3) = 0;
    GOON,2;
    ACT,,,E16;
    ACT,UNFRM(30,50);
E14 GOON,1;
    ACT,,NNACT(41).EQ.0,E15;
    ACT,,NNACT(41).NE.0;
    ACT,1,,E14;
E15 FREE,LEECC/ATRIB(3);                          RELEASE LEECC STAFF.
    TERMINATE;
E16 GOON,1;
    ACT,,NNQ(38).GT.0,E8;                         WAIT FOR MORE PROJS.
    ACT,1,,E16;
;
;
;
;
;
;
;
;     MODEL SEGMENT F     ** ISSUE DESIGN INSTRUCTION TO CORPS **
;
;
;
;
;
;
;
    CREATE,,,,1;
F1  GOON,1;
    ACT,,NNQ(24).GE.10,F2;                        CHECK FOR 10 OR MORE
;                                                 IN FILE 24.
    ACT,,NNQ(24).GT.0.AND.NNQ(24).LT.10.AND.NNACT(25).EQ.0,F3;
    ACT,,,F7;
F2  ASSIGN,ATRIB(3)= 2;                           ASSIGN 2 AFRCE PROJECT
    ACT,,,F4;                                     MANAGERS (PM).
F3  ASSIGN,ATRIB(3)= 1;                           ASSIGN 1 AFRCE PM.
F4  GOON;
    AWAIT(23),AFRCE/ATRIB(3);
```

```
F5   OPEN,DI,1;                                   AFRCE FORWARDS DESIGN
     ACT,,NNQ(24).EQ.0,F6;                        INSTRUCTION TO COE.
     ACT,1,,F5;
F6   GOON,1
     ACT/97,5;
     CLOSE,DI;
     ACT,UNFRM(4,8);                              PROCESS FOR COE ISSUE.
     FREE,AFRCE/ATRIB(3);
F7   GOON,1;
     ACT,1,,F1;
;
;
;
;
;     MODEL  SEGMENT G      ** ARCHITECT-ENGINEER (AE) SELECTION **
;
;
;
;
     CREATE,,,,1;
G1   GOON;
     ACT;
     ASSIGN,ATRIB(3) = 0;                         RESET COUNTER.
     GOON,1;
     ACT,,NNQ(28).EQ.0,G7;
     ACT,,NNQ(28).LT.5.AND.NNQ(24).EQ.0.AND.NNACT(26).EQ.0,G2;
     ACT,,NNQ(28).EQ.5,G2;
     ACT,,NNQ(28).GT.5,G5;
     ACT,,,G7;
G2   AWAIT(25),COE/1;                             WAIT FOR COE PM.
     ASSIGN,ATRIB(3) = 1;                         ASSIGN 1 COE PM.
     ASSIGN,XX(8) = UNFRM(20,35);                 ASSIGN TIMES FOR:
     ASSIGN,XX(9) = UNFRM(3,8);                   XX(8)---PREP DESIGN
                                                          SCHEDULE.
     ASSIGN,XX(10) = EXPON(10,3);                 XX(9)---PREPARE CBD
                                                          ANNOUNCEMENT.
G3   OPEN,CORPS,1;                                XX(10)--AE SELECTION.
     ACT/98,4;
     GOON,1;
     ACT,,XX(7).LE.5.AND.XX(7).GT.0,G6;           ASSIGN GROUPS OF 5.
     ACT,,XX(7).GT.5,G4;
     ACT,1,,G3;
G4   AWAIT(26),COE/1;                             ASSIGN ADDITIONAL COE
     ASSIGN,ATRIB(3) = 2;                         (NOW 2 ASSIGNED).
     ACT,,,G6;
G5   AWAIT(27),COE/2;                             DI ISSUED TO COE.
     GOON;
     ASSIGN,XX(8) = UNFRM(20,45);
     ASSIGN,XX(9) = UNFRM(5,9);
     ASSIGN,XX(10) = EXPON(10,3);
     GOON;
     OPEN,CORPS,1;
```

```
     ACT/98,4;
     ASSIGN,ATRIB(3) = 2;                     ASSIGN 2 COE PMs.
G6   CLOSE,CORPS;
     ASSIGN,XX(7) = 0;                        RESET COUNTER.
     GOON,2;                                  START DUAL PATH.
     ACT,1,,G1;
     ACT;
     AWAIT(12),AFRCE/1;
     ACT,XX(10);                              AE SELECTION BOARD.
     FREE,AFRCE/1;
     GOON;
     ACT,UNFRM(5,21);                         NEGOTIATE WITH AE.
     GOON;
     ACT,9;
     GOON;
     ACT,UNFRM(5,20);                         PREPARE,SUBMIT AND
     FREE,COE/ATRIB(3);                       REVIEW AUDIT OF AE.
     TERMINATE;
G7   GOON;
     ACT,1,,G1;
     TERMINATE;
     GOON;
;
;
;
     CREATE,,,,1;                             ACCOMPLISH 30% DESIGN
G8   GOON,1;                                  REVIEW.
;
     ACT,,NNQ(30).GT.0.AND.NNQ(30).LT.5.AND.NNACT(31).EQ.0,G9;
     ACT,,NNQ(30).EQ.5,G9;
     ACT,,NNQ(30).GT.5.AND.NNQ(30).LE.15,G10;
     ACT,,NNQ(30).GT.15,G11;
     ACT,1,.G8
G9   ASSIGN,ATRIB(7) = 1;                     ASSIGNING NUMBER OF
     ACT,,,G12;                               RESOURCES REQUIRED
G10  ASSIGN,ATRIB(7) = 2;                     BASED ON NUMBER OF
     ACT,,,G12;                               PROJECTS WAITING.
G11  ASSIGN,ATRIB(7) = 4;
G12  GOON,1;                                  SELECT ONE OF THE
     ACT,,NNQ(29).EQ.0,G12A;                  FOLLOWING ACTIVITIES.
     ACT,,NNQ(29).NE.0;
     GOON,1;
     ACT,1,,G8;
GA2  AWAIT(29),COE/ATRIB(7);
     ASSIGN,XX(21) = EXPON(3);                TIME FOR COE TO DIST-
     ASSIGN,XX(22) = TNOW;                    RIBUTE TO REVIEWERS.
     OPEN,REV30;
     ACT/99,1;
     CLOSE,REV30;
     GOON,2;                                  TAKE BOTH ACTIVITIES.
     ACT,5,,G8;                               GO TO G8.
     ACT;                                     CONTINUE TO NEXT.
```

```
     AWAIT(31),AFRCE/ATRIB(7);                 WAIT FOR REVIEWERS.
     AWAIT(32),MDEE/ATRIB(7);
     AWAIT(33),BDEE/ATRIB(7);
G13  GOON,1;
     ACT,,NNACT(36).EQ.0,G14;                  HOLD REVIEWERS TILL
     ACT,3,,G13;                               ALL PROJS COMPLETE
G14  FREE,MDEE/ATRIB(7);                       REVIEW PROCESS(ACT/36
     FREE,BDEE/ATRIB(7);                       & 37 IN MAIN PROGRAM.
G15  GOON,1;
     ACT,,NNACT(37).EQ.0,G16;
     ACT,3,,G15;
G16  FREE,AFRCE/ATRIB(7);
     GOON,1;
     FREE,COE/ATRIB(7);
     TERMINATE;
;
;
;
;           MODEL SEGMENT H       ** DESIGN BY SYSTEM CONTRACTOR **
;                 (PROGRAMMING STILL DONE BY AIR FORCE)
;
;
;
;
H0   AWAIT(55),AFRCE/1;
     AWAIT(56),COE/1;                          CRITERIA REV. MEETING
     ACT,UNFRM(1,2);                           WITH SYSTEM CONTRACTOR
     FREE,AFRCE/1;                             AND HIS AE.
     FREE,COE/1;
     ASSIGN,ATRIB(3) = UNFRM(300,500);         DESIGN TIME.
     ASSIGN,ATRIB(4) = .35 * ATRIB(3);         TIME ALLOWED FOR 35%
     ACT,ATRIB(4);                             OF DESIGN.
     AWAIT(57),COE/1;
     AWAIT(58),AFRCE/1;
     ACT,UNFRM(3,5);                           35% COST ESTIMATE TO LEE
     FREE,COE/1;
     FREE,AFRCE/1;
     COLCT,INT(1),TIME TO 30%;
DES  QUEUE(59),,,,MTH;
PRO  QUEUE(60),,,,MTH;
MTH  MATCH,11,DES/H1,PRO/H3;                   PROGRAMMING THROUGH F-
;                                              PANEL & 35% COST MUST
;                                              BE COMPLETE BEFORE
H1   ASSIGN,ATRIB(4) = ATRIB(3) - ATRIB(4);    CONTINUE DESIGN.
     ACT,ATRIB(4);                             CONTINUE DESIGN TO 95%.
DE2  QUEUE(61),,,,SAM;
PR2  QUEUE(62),,,,SAM;
SAM  MATCH,11,DE2/H5,PR2/H5;
H5   ACCUM,2,2,HIGH(7),1;
     ASSIGN,ATRIB(3) = 0;
     ASSIGN,ATRIB(4) = 0;
```

```
     ACT,,,H6;                                  RETURN TO MAIN PROGRAM
;                                               FOR 95% REVIEW AND CON-
;                                               STRUCTION .
;
;
;
;

;  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
;  *                                                             *
;  *            * * * * *   MAIN PROGRAM   * * * * *             *
;  *                                                             *
;  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
;
;      ALL PROCESSING FOR WEAPONS SYSTEM AND OTHER MCP PROJECTS IS
; ACCOMPLISHED IN THIS PART OF THE PROGRAM, EXCEPT THE DESIGN OF
; WEAPONS SYSTEM PROJECTS WHICH IS ACCOMPLISHED IN MODEL SEGMENT
; H. GATES AND MULTIPLE USE RESOURCES ARE CONTROLLED IN THE MODEL
; SEGMENTS ABOVE.
     CREATE,0,30,,20;
     ACT,,,M0;
     CREATE,17,47;
M0   GOON;
     AWAIT(44/20),NEED,BALK(M9);                GATE NEED, RELEASE IS
     ASSIGN,ATRIB(10) = XX(88);                 CONTROLED IN SEGMENT A.
     ASSIGN,XX(99) = XX(99) + 1;                ASSIGN # TO XX(99) TO
     ASSIGN,ATRIB(11) = XX(99);                 IDENTIFY EACH PROJECT.
     ACT;                                       XX(88) = TIME OF FRP.
     ASSIGN,XX(4) = XX(4) + 1;
     ASSIGN,ATRIB(9) = UNFRM(0,4,2);            ASSIGN PRIORITY.
     ASSIGN,ATRIB(7) = 1;                       IDENTIFY THE BED DOWN
     ASSIGN,ATRIB(2) = 0;                       FACILITIES.
     GOON,1;
     ACT,,.85,M1;                               FACILITY REQUIREMENTS
;                                               PLAN ADEQUATE TO START
;                                               PROGRAMMING.
     ACT,,.15;                                  FACILITY REQUIREMENTS
;                                               PLAN (FRP) INADEQUATE.
     GOON,1;
     ACT/2,UNFRM(140,185),,M2;                  FRP REVISED.
M1   GOON,1;
     ACT,,.95,M2;                               95% HAVE CONSTRUCTION
     ACT,,.05;                                  SITE ASSIGNED.
     ASSIGN,ATRIB(2) = TNOW;
     AWAIT(2),BASE/1;                           WAITING FOR SITE ASSIGN-
     ACT/1,RNORM(90,50,1);                      MENT.
     FREE, BASE/1;
     ASSIGN,ATRIB(2) = TNOW - ATRIB(2);         TIME SITE ASSIGNED.
M2   ASSIGN,ATRIB(1) = TNOW;
     AWAIT(1),REQ/1;                            ASSEMBLE SITE SURVEY
     AWAIT(9),BDEE/1;                           TEAM.
     AWAIT(52),MPROG/1;
```

```
     ACT/3,UNFRM(0,3);                        SURVEY AT SELECTED
     FREE,BDEE/1;                             BASE.
     FREE,MPROG/1;
     ACT/4,UNFRM(30,45);                      PREPARE FORMS 1391 &
;                                             PROJECT BOOKLETS (PB).
     FREE,REQ/1;
     ACT,,,M3;
M2A  ASSIGN,ATRIB(7) = 4;                     IDENTIFY RETURNED PROJS.
;
M3   AWAIT(3),MPROG/1;                        MAJCOM PROGRAMMER.
     ACT/5,UNFRM(3,10);                       MAJCOM REVIEW.
     FREE,MPROG/1;                            MAJCOM PROGRAMMER.
     ACT/6,UNFRM(7,30);                       REVIEW AND COORDINATION.
     AWAIT(4),REQ/1;                          BASE PROGRAMMER.
     ACT/7,EXPON(5,3);                        REVISE PB'S.
     FREE,REQ/1;
     AWAIT(5),MPROG/1;
     ACT/8,UNFRM(10,16);                      MAJCOM REVIEW AND PREP.
;                                             FOR TRANSMITTAL TO LEECD
     FREE,MPROG/1;
     ACT,UNFRM(9,25);                         PRINTING AND TRANSMITTAL.
     GOON,2;
     ACT,,,H0;                                START DESIGN WITH SYS.
     ACT;                                     CONTRACTOR'S AE.
     GOON,1;
     ACT,,ATRIB(7).EQ.4,M7;
     ACT;
     COLCT,INT(1),START DESIGN;
     GOON,1;
     ACT,,,M7;
     CREATE,2,2,4;                            NON-MODERNIZATION PROJS.
     ACT,UNFRM(95,170);                       FROM OTHER MAJCOMS.
     ASSIGN,ATRIB(9) = UNFRM(0,4);            ASSIGN PRIORITY.
     ASSIGN,ATRIB(7) = 2;                     IDENTIFY PROJS. FROM
;    OTHER MAJCOMS (NON-MOD).                 OTHER SOURCES.
     ACT,,,M7;
     CREATE,0,0,4,250;
     ASSIGN,ATRIB(7) = 3;                     IDENTIFY MODERNIZATION
;                                             PROJECTS.
     ACT,,,M4;
;
     CREATE,1,10,4;                           MODERNIZATION PROJS.
     ASSIGN,ATRIB(7) = 3;                     TO HQ USAF/LEE.
M4   GOON;
     AWAIT(6/250),OTHER,BALK(M9);             GATE CONTROL IN SEG. A.
     ASSIGN,ATRIB(4) = TNOW;
     ASSIGN,XX(6) = XX(6) + 1;
     ACT,UNFRM(115,130);
     GOON,1;
     ACT,,.80,M5;
     ACT,,.20;
     ASSIGN,ATRIB(9) = UNFRM(0,1);            20% ASSIGNED PRI. 1.
```

```
     ACT,,,M6;
M5   ASSIGN,ATRIB(9) = UNFRM(1,4);              ASSIGN REMAINING PRI.

M6   AWAIT(8),CALL;                             USAF CALL FOR MODERN-
     AWAIT(53),HOLD;                            IZATION PROJECTS.
     ASSIGN,XX(2) = XX(2) + 1;
     ACT,,,M8;                                  GATE CONTROL IN SEG. B.
M7   AWAIT(10),CALLN;                           USAF CALL FOR NON-MOD-
     AWAIT(54),HOLD1;                           ERNIZATION PROJECTS IN
;                                               NOVEMBER.
;
     ASSIGN,XX(15) = XX(15) + 1;
     ACT;                                       GATE CONTROL IN SEG. B.
M8   GOON,1;
     ACT/9,UNFRM(1,3);                          PREPARE FOR F-PANEL.
     GOON;
     ACT/10,UNFRM(2,4);                         F-PANEL REVVIEW.
     AWAIT(14),FRC;
     GOON,1;
     ACT,,ATRIB(7).EQ.4,M10;
     ACT;
     ASSIGN,ATRIB(5) = 0;
     GOON,1;
     ACT,,ATRIB(7).NE.1,M8A;
     ACT;
     GOON,1;
     ACT,,.75,M10;
     ACT,,.25,M8A;
M8A  GOON,1;
     ACT/11,,.65,M10;                           35% REJECTED.
     ACT,,.35;
     GOON,1;
     ACT/12,,ATRIB(7).EQ.1,M2A;                 REJECTED BED DOWN PROJ.
     ACT;                                       SENT BACK TO STATEMENT
M9   TERMINATE;                                 M2A-MAJCOM PROGRAMMERS.
M10  GOON,1;
     ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M12;
     ACT;
     GOON,1;
     ACT/13,,.73,M12;
     ACT/14,,.27;                               27% REQ TITLE 10, 2807
     ASSIGN,ATRIB(8)=TNOW;                      ACTION BY CONGRESS.
     ASSIGN,XX(5)=XX(5)+1;
     AWAIT(16),CONG28;
     ACT/15,XX(1);                              STAFF 2807 ACTION.
     GOON,1;
     ACT/16,,.95,M11;
     ACT/17,,.05;                               CONGRESS HAS QUESTIONS
     GOON;                                      ON 5% OF THE PROJECTS.
     ACT/18,UNFRM(2,18);                        CONGRESSIONAL QUESTIONS
;                                               RETURNED TO LEECC.
     AWAIT(17),LEECD/1;
```

```
      ACT/19,UNFRM(3,10);                          PREPARE CONGRESSIONAL
 ;                                                 RESPONSE.
      FREE,LEECD/1;
M11   GOON;
      ACT/20,21;                                   WAIT 21 DAYS BEFORE
      ASSIGN,ATRIB(5) = TNOW - ATRIB(8);           RELEASE FROM CONGRESS.
M12   AWAIT(18),LEECD/1;
      ACT/21,UNFRM(0,1);                           ISSUE DI.
      FREE,LEECD/1;
      GOON,1;
      AWAIT(21),DISTR;                             RELEASE OF DI(35%)
      GOON,1
      ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M13;
      ACT;
      GOON,1;
      ACT,,.20,M14;
      ACT/22,,.80;                                 PROJECTS TO OTHER
      GOON,1;                                      AFRCES.
      TERMINATE;
M13   COLCT,INT(1),PROJ. PROGRAMMED;
      ACT,,,M15;
M14   GOON,1;
M15   GOON,1;
      ACT/23,,.60,M16;
      ACT/24,,.40;
      AWAIT(22),REQ/1;                             BASE REVISE PB & 1391.
      ACT/25,UNFRM(4,9);
      FREE,REQ/1;
M16   GOON,1;                                      GO TO MODEL SEGMENT H
      ACT,,ATRIB(7).NE.1.AND.ATRIB(7).NE.4,M6A;  IF WEAP. SYS. PROJ.
      ACT,,,PRO;                                   PROGRAMMING COMPLETE.
M6A   AWAIT(24),DI;                                DESIGN INSTRUCTION TO
      ACT/26,UNFRM(3,6);                           CORPS. ISSUED BY AFRCE.
      AWAIT(28),CORPS;
      ASSIGN,XX(7) = XX(7) + 1;
      ASSIGN,ATRIB(8) = TNOW;
      ASSIGN,ATRIB(3) = XX(8);                     TIME FOR PREP. OF DE-
 ;                                                 SIGN SCHEDULE BY COE.
      GOON;
      ACT/27,XX(9);                                PREPARE CBD ANNOUNCE-
      GOON;                                        MENT.
      ACT/28,UNFRM(20,55);                         ADVERTIZE AND AWAIT AE
 ;                                                 RESPONSE.
      GOON;
      ACT/29,XX(10);                               AE SELECTION.
NA    GOON;
      ASSIGN,ATRIB(6) = TNOW - ATRIB(8);           CHECK TIME FOR PREP.
      ASSIGN,ATRIB(6) = ATRIB(6) - ATRIB(3);       OF COE FINAL DESIGN
      GOON,1;                                      SCHEDULE.
      ACT,,ATRIB(6).GE.0,NO;
      ACT,1,,NA;
NO    GOON,1;
```

```
    ACT/30,UNFRM(45,100);                        ISSUE NOTICE TO PRO-
;                                                CEED TO AE.
    GOON;
    ACT/31,UNFRM(60,120);                        30% DESIGN COMPLETION.
    GOON,1;
    ACT,,ATRIB(7).NE.1.AND.ATRIB(7).NE.4,M17;    PROJS OTHER THAN
    ACT/32,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4;      WEAPON SYS PROJS.
    GOON;
    ACT,,,M18;
M17 GOON,1;
M18 ASSIGN,ATRIB(8) = TNOW - ATRIB(2);
    GOON,1;
    ACT,,ATRIB(2).EQ.0,M19;                      SEPARATE SITE DELAYED
    ACT,,ATRIB(2).NE.0;                          FROM THOSE WHICH HAD
    GOON;                                        SITE ORIGINALLY.
    COLCT,INT(8),HOST BASE ASSIGNED;             SITE ASSIGNMENT STATS.
M19 GOON,1;
    ACT,,ATRIB(5).EQ.0,M20;                      COLLECT STATS ONLY ON
    ACT,,ATRIB(5).NE.0;                          PROJS WHICH HAD DELAY.
    ASSIGN,ATRIB(5) = TNOW - ATRIB(5);
    COLCT,INT(5),CONG. DELAY;
M20 GOON;
    AWAIT(30),REV30;                             30% DESIGN REVIEW.
    ASSIGN,ATRIB(6) = XX(22);
    ACT/33,XX(21);                               PREPARE FOR DIST. OF
    GOON,1;                                      30% DESIGN PACKAGE.
    ACT;
    ASSIGN,ATRIB(6) = 45 - TNOW + ATRIB(6); TIME REMAINING FOR REV.
    GOON,1;
    ACT/34,,ATRIB(6).LE.0,M21;                   REVIEW TIME EXPIRED.
    ACT/35,,ATRIB(6).GT.0;                       REVIEW TIME REMAINING.
    GOON;
    ACT/36,ATRIB(6);                             ACCOMPLISH REVIEW IF
M21 GOON,1;                                      TIME REMAINING.
    ACT,UNFRM(4,12);                             AFRCE COMPILES & TRANS-
    GOON;                                        MITS COMMENTS TO COE.
    ACT,UNFRM(1,2);                              DESIGN REVIEW MEETING.
    GOON;
    ACT/37,UNFRM(5,15);                          COE COMPILES COMMENTS.
    GOON;
    ACT,UNFRM(20,30);                            AE INCORPORATES COMMENTS
    AWAIT(34),COE/1;                             & RETURNS 35% TO COE.
    ACT/38,UNFRM(2,5);                           COE FORWARDS TO AFRCE.
    FREE,COE/1;
    AWAIT(35),AFRCE/1;                           AFRCE PREPARES 1178 AND
    ACT,UNFRM(0,2);                              FORWARDS TO LEECC.
    FREE,AFRCE/1;
H3  AWAIT(37),CALL2;                             PROJECTS TO LEECC ON 1
    ACT/39,EXPON(60);                            AUG. OSD REVIEWS & IN-
    GOON,1;                                      CLUDES PROJS IN BUDGET.
    AWAIT(38),DI100;                             AUTHORIZED TO PROCEED
;                                                WITH DESIGN TO 100%.
```

```
       ASSIGN,XX(3) = XX(3) + 1;
       GOON,1;
       ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M22;
       ACT;
       GOON,1;
       ACT/40,,.95,M22;                       95% TO CONG.IN BUDGET.
       ACT,,.05;                              5% DESIGN CANCELLED--
       TERMINATE;                             AND PROJ. TERMINATED.
M22    GOON;
       ACT/41,UNFRM(165,185);                 CONG. REVIEWS & PASSES
       GOON,1;                                MILCON BILL.
       ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4,M23;
       ACT;
       GOON,1;
       ACT,,.95,M23;                          95% IN MCP BILL.
       ACT,,.05;                              5% NOT INCLUDED --
       TERMINATE;                             CANCELL DESIGN & PROJ.
M23    GOON;
       ACT/42,UNFRM(60,80);                   CONGRESS/OSD PROVIDE
 ;                                            FUNDING FOR CONSTR.
       GOON;
       ACT,UNFRM(2,3);                        NOTIFY MAJCOM'S ETC.
       GOON,1;                                OF PROJECTS FUNDED.
       ACT,,ATRIB(7).EQ.4,H4;                 WEAPONS SYS. PROJ TO
       ACT,,ATRIB(7).NE.1,H6;                 MODEL SEGMENT H.
       ACT;
       ASSIGN,ATRIB(7) = 0;                   COMPLETED 95% DESIGN
H4     GOON,1;                                FROM SYSTEM CONTRACTOR
       ACT,,,PR2;                             -- MODEL SEGMENT H.
H6     GOON;                                  PROJECTS FUNDED.
       ACT/43,UNFRM(15,25);                   COMPLETE 95% DESIGN -
 ;                                            REVIEW (ALL PARTIES).
       GOON;
       ACT,UNFRM(17,30);                      AE INCORPORATES ALL
       GOON;                                  COMMENTS
       ACT/44,UNFRM(15,25);                   COE BACKCHECKS DESIGN;
 ;                                            INSURES ALL COMMENTS
       AWAIT(42),NEWFY;                       ARE INCORPORATED.
       GOON;
       AWAIT(41),COE/1;
       ACT,EXPON(2);                          COE PREPARES ADVERTISE-
  ;                                           MENT FOR CONSTRUCTION.
       FREE,COE/1;
       ACT/45,UNFRM(35,50);                   ADVERTISE FOR CONSTR.
       GOON;
       ACT/46,UNFRM(4,10);                    CONTRACT AWARD.
       GOON;
       ACT,UNFRM(7,14);                       NOTICE TO PROCEED.
       GOON;
       ACT/47,UNFRM(285,720);                 FACILITY CONSTRUCTION
       ASSIGN,ATRIB(3) = 0;                   PERIOD.
       GOON,1;
```

```
     ACT,,.40,M28;
     ACT,,.60;                              CONSTRUCTION CHANGE REQ.
M24  GOON,1;                                ON 60% OF THE PROJECTS.
     ACT,,.80,M26;
     ACT,,.05,M27;
     ACT,,.15;
M25  GOON,1;                                CUMMULATIVE CHANGES
     AWAIT(45),COE/1;                       TOTAL BETWEEN 5% AND
     ACT,UNFRM(1,3);                        15% OF PROJECTS PA.
     FREE,COE/1
     AWAIT(46),AFRCE/1;                     COE FORWARDS TO AFRCE.
     ACT,EXPON(2);
     FREE,AFRCE/1;                          AFRCE FORWARDS TO USAF.
     AWAIT(47),LEECC/1;                     USAF/LEECC PROCESSES
     ACT/49,UNFRM(5,7);                     REQUEST FOR ADDED FUNDS.
     FREE,LEECC/1;
     ASSIGN,ATRIB(3) = ATRIB(3) + 1;        COUNT CHANGES PER PROJ.
     GOON,1;
     ACT,,.55,M28;                          55% NO FURTHER CHANGE.
     ACT,,.45;                              45% MORE CHANGES.
     GOON,1;                                AF AVE. IS 2.5 /PROJ.
     ACT,,ATRIB(3).EQ.2,M27;                NEXT CHANGE WILL CAUSE
     ACT,,ATRIB(3).EQ.3,M28;                INCREASE TO EXCEED 25%
;                                           OF PA.  THEREFORE REQ.
     ACT,,,M25;                             CONG.ACTION(GO TO M27).
M26  ASSIGN,ATRIB(3) = ATRIB(3)  + 1;       COUNT CHANGES PER PROJ.
     AWAIT(48),COE/1;
     ACT/48,UNFRM(5,7);                     CUMMULATIVE COST OF
     FREE,COE/1;                            CHANGES NOT GREATER
;                                           THAN 5% OF PROJECT PA.
     GOON,1;
     ACT,,.20,M28;                          20% NO FURTHER CHANGE.
     ACT,,.80;
     GOON,1;                                CHECK # OF CHANGES.
     ACT,,ATRIB(3).EQ.3,M28;                ALLOW MAXIMUM OF 3
     ACT,,,M24;                             CHANGES PER PROJECT.
M27  GOON,1;
     ASSIGN,ATRIB(3) = ATRIB(3) + 1;        COUNT CHANGES.
     AWAIT(49),COE/1;
     ACT,UNFRM(1,2);                        CUMMULATIVE COST OR
     FREE,COE/1;                            COST OF THIS CHANGE
     AWAIT(50),AFRCE/1;                     > 25% OF PROJ. PA.
     ACT,EXPON(2);                          AFRCE FORWARDS TO
     FREE,AFRCE/1;                          USAF/LEECC.
     AWAIT(51),LEECC/1;
     ACT,UNFRM(5,7);                        LEECC FORWARDS TO
     FREE,LEECC/1;                          CONGRESS.
     ACT/50,UNFRM(45,60);                   CONG. REVIEWS AND
     GOON,1;                                APPROVES FUNDING.
     ACT,,.65,M28;                          65% NO MORE CHANGES.
     ACT,,.35;
     GOON,1;
```

```
    ACT,,ATRIB(3).GT.1,M28;                ALLOW MAX. OF 2
    ACT,,,M24;                             CHANGES PER PROJ.
M28 ASSIGN,ATRIB(8) = TNOW - ATRIB(7);
    COLCT,INT(8),TYPE PROJECT,4,0,1;
    ASSIGN,ATRIB(3) = TNOW - ATRIB(3);
    COLCT,INT(3),CONSTR. CHANGES,3/0/1;
    GOON,1;
    ACT,,ATRIB(7).NE.1.AND.ATRIB(7).NE.4,M33;
    ACT,,ATRIB(7).EQ.1.OR.ATRIB(7).EQ.4;
    COLCT,INT(1),TIME COMPLETE;            STATS.ON COMPL. TIME.
    ASSIGN,ATRIB(10) = ATRIB(10) + UNFRM(100,365) + 1825;
    ASSIGN,ATRIB(10) = TNOW - ATRIB(10);
    GOON,1;
    ACT,,ATRIB(10).GT.0,M29;               PROJ. COMPLETED LATE.
    ACT,,ATRIB(10).LT.0,M30;               PROJ. COMPLETED EARLY.
    ACT,,ATRIB(10).EQ.0,M31;               PROJ. ON TIME.
M29 ASSIGN,ATRIB(10) = 3;
    ACT,,,M32;
M30 ASSIGN,ATRIB(10) = 1;
    ACT,,,M32;
M31 ASSIGN,ATRIB(10) = 2;
M32 GOON,1;
    ASSIGN,ATRIB(10) = TNOW - ATRIB(10);
    COLCT,INT(10),DELIVERY STATUS,3/0/1;
    GOON,1;
    ASSIGN,ATRIB(9)=TNOW-ATRIB(9);
    COLCT,INT(9),PRIORITY,4/0/1;
    ACT,,,M34;
M33 GOON;
    GOON;
    ASSIGN,ATRIB(9) = TNOW - ATRIB(9);
M34 GOON,1;
    ENDNETWORK;
;
;
INIT,0,5840;                               SIMULATE 10 YRS. AFTER
;                                          A 6 YR. WARM-UP PERIOD.
MONTR,SUMRY,2190,365
MONTR,CLEAR,2190,365;                      COLLECT AFTER 6 YEAR
FIN;                                       WARM-UP.
```

An explanation of the statistical values contained in the SLAM Summary Report, which immediately follows this program listing can be found in Appendix G.

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT MCP FACILITY MODEL        BY BLAKE & MARCHBANKS

DATE  8/14/1985                              RUN NUMBER   1 OF   1

CURRENT TIME   .2190E+04
STATISTICAL ARRAYS CLEARED AT TIME   .0000E+00

END WARM-UP PERIOD

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .333E+03 | .810E+02 | .243E+00 | .217E+03 | .632E+03 | 120 |
| START DESIGN | .140E+03 | .372E+02 | .265E+00 | .824E+02 | .248E+03 | 122 |
| PROJ. PROGRAMMED | .293E+03 | .978E+02 | .334E+00 | .107E+03 | .676E+03 | 120 |
| HOST BASE ASSIGN | .840E+02 | .000E+00 | .000E+00 | .840E+02 | .840E+02 | 1 |
| CONG. DELAY | .730E+02 | .974E+01 | .133E+00 | .456E+02 | .103E+03 | 82 |
| TYPE PROJECT | .214E+01 | .928E+00 | .434E+00 | .100E+01 | .400E+01 | 101 |
| CONSTR. CHANGES | .113E+01 | .122E+01 | .108E+01 | .000E+00 | .300E+01 | 101 |
| TIME COMPLETE | .151E+04 | .176E+03 | .117E+00 | .119E+04 | .194E+04 | 37 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 37 |
| PRIORITY | .179E+01 | .120E+01 | .672E+00 | .755E-01 | .400E+01 | 37 |

## **RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.39 | 1.713 | 5 | 5 |
| 2 | LEECC | 6 | 1.95 | 2.198 | 6 | 3 |
| 3 | REQ | 6 | 3.03 | 2.565 | 6 | 0 |
| 4 | BDEE | 7 | 1.93 | 2.170 | 7 | 0 |
| 5 | BASE | 1 | .12 | .328 | 1 | 0 |
| 6 | MDEE | 5 | 1.81 | 2.091 | 5 | 0 |
| 7 | MPROG | 6 | 1.59 | 1.701 | 6 | 1 |
| 8 | AFRCE | 9 | 4.42 | 3.408 | 9 | 2 |
| 9 | COE | 18 | 6.69 | 5.551 | 18 | 6 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0128 |
| 7 | FRC | OPEN | .0203 |
| 8 | DI | CLOSED | .0959 |
| 9 | DISTR | CLOSED | .0662 |
| 10 | CORPS | CLOSED | .0767 |
| 11 | REV30 | CLOSED | .0251 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .2634 |
| 14 | HOLD | CLOSED | .9797 |
| 15 | HOLD1 | CLOSED | .9797 |

**HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 36  .356  .100E+01 +******************                               +
 16  .158  .200E+01 +********                 C                       +
 48  .475  .300E+01 +************************                         C
  1  .010  .400E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
101                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .214E+01 | .928E+00 | .434E+00 | .100E+01 | .400E+01 | 101 |

**HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 45  .446  .000E+00 +**********************                           +
 22  .218  .100E+01 +***********                     C                +
 10  .099  .200E+01 +*****                                C           +
 24  .238  .300E+01 +************                                     C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
101                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .113E+01 | .122E+01 | .108E+01 | .000E+00 | .300E+01 | 101 |

**HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 37 1.000  .100E+01 +**************************************************
  0  .000  .200E+01 +                                                 C
  0  .000  .300E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 37                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 37 |

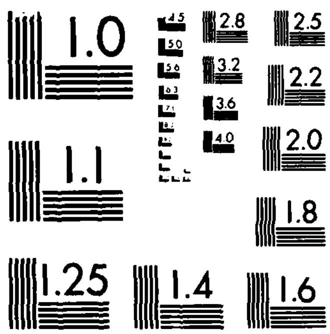
AD-A161 116 ANALYSIS AND MODELING OF THE FACILITY ACQUISITION PROCESS AS IT RELATES T..(U) AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYST L J BLAKE 4/4

UNCLASSIFIED SEP 85 AFIT/GEM/LSY/85S-9 F/G 15/5 NL

END

FILMED

DTIC




MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  9  .243  .100E+01 +************                                     +
 15  .405  .200E+01 +********************           C                 +
  3  .081  .300E+01 +****                               C             +
 10  .270  .400E+01 +**************                                   C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 37                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .179E+01 | .120E+01 | .672E+00 | .755E-01 | .400E+01 | 37 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/14/1985          RUN NUMBER 1 OF 1

CURRENT TIME .2555E+04
STATISTICAL ARRAYS CLEARED AT TIME .2190E+04

END OF YEAR 7

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .314E+03 | .653E+02 | .208E+00 | .225E+03 | .513E+03 | 22 |
| START DESIGN | .133E+03 | .263E+02 | .197E+00 | .903E+02 | .192E+03 | 20 |
| PROJ. PROGRAMMED | .298E+03 | .137E+03 | .459E+00 | .135E+03 | .656E+03 | 20 |
| HOST BASE ASSIGN | | | NO VALUES RECORDED | | | |
| CONG. DELAY | .685E+02 | .104E+02 | .152E+00 | .466E+02 | .795E+02 | 13 |
| TYPE PROJECT | .232E+01 | .836E+00 | .360E+00 | .100E+01 | .400E+01 | 97 |
| CONSTR. CHANGES | .137E+01 | .129E+01 | .943E+00 | .000E+00 | .300E+01 | 97 |
| TIME COMPLETE | .158E+04 | .171E+03 | .109E+00 | .136E+04 | .204E+04 | 23 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 23 |
| PRIORITY | .157E+01 | .104E+01 | .662E+00 | .319E-01 | .391E+01 | 23 |

## **RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.42 | 1.673 | 5 | 5 |
| 2 | LEECC | 6 | 3.09 | 2.163 | 6 | 6 |
| 3 | REQ | 6 | 3.10 | 2.425 | 6 | 1 |
| 4 | BDEE | 7 | 2.19 | 1.888 | 7 | 0 |
| 5 | BASE | 1 | .34 | .057 | 1 | 1 |
| 6 | MDEE | 5 | 2.06 | 1.790 | 5 | 0 |
| 7 | MPROG | 6 | 1.74 | 1.608 | 6 | 1 |
| 8 | AFRCE | 9 | 4.76 | 2.737 | 9 | 2 |
| 9 | COE | 18 | 8.14 | 4.429 | 18 | 4 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0274 |
| 8 | DI | CLOSED | .1233 |
| 9 | DISTR | OPEN | .1068 |
| 10 | CORPS | CLOSED | .0986 |
| 11 | REV30 | CLOSED | .0329 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .3278 |
| 14 | HOLD | CLOSED | .9726 |
| 15 | HOLD1 | CLOSED | .9726 |

**HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA    UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 22  .227  .100E+01 +***********                                      +
 23  .237  .200E+01 +************          C                          +
 51  .526  .300E+01 +***************************                     C+
  1  .010  .400E+01 +*                                                C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 97                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .232E+01 | .836E+00 | .360E+00 | .100E+01 | .400E+01 | 97 |

**HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS  RELA  UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 38  .392  .000E+00 +********************                             +
 16  .165  .100E+01 +********                   C                     +
 12  .124  .200E+01 +******                           C               +
 31  .320  .300E+01 +****************                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 97                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .137E+01 | .129E+01 | .943E+00 | .000E+00 | .300E+01 | 97 |

**HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS  RELA  UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 23 1.000  .100E+01 +**************************************************
  0  .000  .200E+01 +                                                 C
  0  .000  .300E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 23                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 23 |

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS   RELA    UPPER
FREQ  FREQ   CELL LIM  0         20        40        60        80        100
                       +    +    +    +    +    +    +    +    +    +    +
  0   .000   .000E+00  +                                                 +
  7   .304   .100E+01  +***************                                  +
  8   .348   .200E+01  +*****************                C               +
  6   .261   .300E+01  +*************                                C   +
  2   .087   .400E+01  +****                                             C
  0   .000     INF     +                                                 C
 ---                   +    +    +    +    +    +    +    +    +    +    +
 23                    0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .157E+01 | .104E+01 | .662E+00 | .319E-01 | .391E+01 | 23 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/14/1985          RUN NUMBER 1 OF 1

CURRENT TIME .2920E+04
STATISTICAL ARRAYS CLEARED AT TIME .2555E+04

END OF YEAR 8

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .313E+03 | .539E+02 | .172E+00 | .253E+03 | .519E+03 | 20 |
| START DESIGN | .156E+03 | .386E+02 | .247E+00 | .104E+03 | .230E+03 | 20 |
| PROJ. PROGRAMMED | .344E+03 | .905E+02 | .263E+00 | .316E+03 | .681E+03 | 20 |
| HOST BASE ASSIGN | .775E+02 | .167E+02 | .320E+00 | .710E+02 | .885E+02 | 4 |
| CONG. DELAY | .751E+02 | .267E+01 | .355E-01 | .733E+02 | .787E+02 | 12 |
| TYPE PROJECT | .197E+01 | .804E+00 | .408E+00 | .100E+01 | .400E+01 | 69 |
| CONSTR. CHANGES | .141E+01 | .133E+01 | .947E+00 | .000E+00 | .300E+01 | 69 |
| TIME COMPLETE | .158E+04 | .178E+03 | .113E+00 | .128E+04 | .202E+04 | 23 |
| DELIVERY STATUS | .109E+01 | .417E+00 | .384E+00 | .100E+01 | .300E+01 | 23 |
| PRIORITY | .164E+01 | .123E+01 | .750E+00 | .594E-01 | .391E+01 | 23 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.36 | 1.677 | 5 | 2 |
| 2 | LEECC | 6 | 3.19 | 1.953 | 6 | 3 |
| 3 | REQ | 6 | 2.84 | 2.784 | 6 | 6 |
| 4 | BDEE | 7 | 3.25 | 2.279 | 7 | 0 |
| 5 | BASE | 1 | .16 | .109 | 1 | 0 |
| 6 | MDEE | 5 | 3.12 | 2.205 | 5 | 0 |
| 7 | MPROG | 6 | 1.45 | 1.832 | 6 | 3 |
| 8 | AFRCE | 9 | 6.11 | 2.745 | 9 | 6 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0246 |
| 8 | DI | CLOSED | .0685 |
| 9 | DISTR | CLOSED | .0438 |
| 10 | CORPS | OPEN | .0643 |
| 11 | REV30 | CLOSED | .0301 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .3312 |
| 14 | HOLD | CLOSED | .9754 |
| 15 | HOLD1 | CLOSED | .9754 |

**HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 22  .319  .100E+01 +****************                                 +
 28  .406  .200E+01 +********************              C              +
 18  .261  .300E+01 +*************                                   C+
  1  .014  .400E+01 +*                                                C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 69                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .197E+01 | .804E+00 | .408E+00 | .100E+01 | .400E+01 | 69 |

**HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS  RELA    UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 28  .406  .000E+00 +********************                             +
  9  .130  .100E+01 +*******                   C                      +
  8  .116  .200E+01 +******                          C                +
 24  .348  .300E+01 +*****************                                C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 69                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .141E+01 | .133E+01 | .947E+00 | .000E+00 | .300E+01 | 69 |

**HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS  RELA    UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 22  .957  .100E+01 +************************************************ +
  0  .000  .200E+01 +                                               C +
  1  .043  .300E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 23                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .109E+01 | .417E+00 | .384E+00 | .100E+01 | .300E+01 | 23 |

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS   RELA   UPPER
FREQ  FREQ   CELL LIM 0         20        40        60        80       100
                      +    +    +    +    +    +    +    +    +    +    +
   0  .000  .000E+00  +                                                 +
   9  .391  .100E+01  +********************                             +
   6  .261  .200E+01  +*************                   C                +
   4  .174  .300E+01  +*********                               C        +
   4  .174  .400E+01  +*********                                        C
   0  .000     INF    +                                                 C
 ---                  +    +    +    +    +    +    +    +    +    +    +
  23                  0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .164E+01 | .123E+01 | .750E+00 | .594E-01 | .391E+01 | 23 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL    BY BLAKE & MARCHBANKS

DATE 8/14/1985    RUN NUMBER 1 OF 1

CURRENT TIME .3285E+04
STATISTICAL ARRAYS CLEARED AT TIME .2920E+04

END OF YEAR 9

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .349E+03 | .680E+02 | .195E+00 | .299E+03 | .515E+03 | 24 |
| START DESIGN | .135E+03 | .276E+02 | .204E+00 | .889E+02 | .186E+03 | 20 |
| PROJ. PROGRAMMED | .300E+03 | .121E+03 | .405E+00 | .129E+03 | .639E+03 | 21 |
| HOST BASE ASSIGN | | | NO VALUES RECORDED | | | |
| CONG. DELAY | .636E+02 | .146E+02 | .229E+00 | .473E+02 | .757E+02 | 14 |
| TYPE PROJECT | .230E+01 | .874E+00 | .380E+00 | .100E+01 | .400E+01 | 70 |
| CONSTR. CHANGES | .101E+01 | .120E+01 | .118E+01 | .000E+00 | .300E+01 | 70 |
| TIME COMPLETE | .165E+04 | .129E+03 | .781E-01 | .142E+04 | .193E+04 | 19 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 19 |
| PRIORITY | .231E+01 | .129E+01 | .560E+00 | .385E-01 | .388E+01 | 19 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.42 | 1.731 | 5 | 1 |
| 2 | LEECC | 6 | 2.17 | 2.155 | 6 | 3 |
| 3 | REQ | 6 | 3.16 | 2.648 | 6 | 0 |
| 4 | BDEE | 7 | 1.44 | 2.048 | 6 | 0 |
| 5 | BASE | 1 | .15 | .038 | 1 | 1 |
| 6 | MDEE | 5 | 1.32 | 2.058 | 5 | 0 |
| 7 | MPROG | 6 | 1.55 | 1.566 | 6 | 0 |
| 8 | AFRCE | 9 | 4.25 | 3.887 | 9 | 3 |
| 9 | COE | 18 | 7.53 | 6.752 | 18 | 7 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0180 |
| 8 | DI | CLOSED | .0959 |
| 9 | DISTR | CLOSED | .0685 |
| 10 | CORPS | OPEN | .0755 |
| 11 | REV30 | CLOSED | .0247 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .2654 |
| 14 | HOLD | OPEN | .9820 |
| 15 | HOLD1 | OPEN | .9820 |

**HISTOGRAM NUMBER 6**

TYPE PROJECT

```
 OBS  RELA   UPPER
FREQ  FREQ  CELL LIM 0        20        40        60        80        100
                     +    +    +    +    +    +    +    +    +    +    +
   0  .000  .000E+00 +                                                 +
  17  .243  .100E+01 +************                                     +
  17  .243  .200E+01 +************           C                         +
  34  .486  .300E+01 +***********************                         C+
   2  .029  .400E+01 +*                                                C
   0  .000    INF    +                                                 C
 ---                 +    +    +    +    +    +    +    +    +    +    +
  70                 0        20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .230E+01 | .874E+00 | .380E+00 | .100E+01 | .400E+01 | 70 |

**HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 35  .500  .000E+00 +*************************                        +
 13  .186  .100E+01 +*********                        C               +
  8  .114  .200E+01 +******                                 C         +
 14  .200  .300E+01 +**********                                       C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 70                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .101E+01 | .120E+01 | .118E+01 | .000E+00 | .300E+01 | 70 |

**HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 19 1.000  .100E+01 +**************************************************
  0  .000  .200E+01 +                                                 C
  0  .000  .300E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 19                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 19 |

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
   0 .000  .000E+00 +                                                 +
   3 .158  .100E+01 +********                                         +
   5 .263  .200E+01 +*************       C                            +
   2 .105  .300E+01 +*****                    C                       +
   9 .474  .400E+01 +************************                         C
   0 .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
  19                0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .231E+01 | .129E+01 | .560E+00 | .385E-01 | .388E+01 | 19 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/14/1985          RUN NUMBER 1 OF 1

CURRENT TIME .3650E+04
STATISTICAL ARRAYS CLEARED AT TIME .3285E+04

END OF YEAR 10

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .322E+03 | .622E+02 | .193E+00 | .265E+03 | .490E+03 | 19 |
| START DESIGN | .129E+03 | .296E+02 | .230E+00 | .926E+02 | .210E+03 | 20 |
| PROJ. PROGRAMMED | .298E+03 | .113E+03 | .378E+00 | .144E+03 | .644E+03 | 14 |
| HOST BASE ASSIGN | .796E+02 | .138E+02 | .154E+00 | .690E+02 | .750E+02 | 4 |
| CONG. DELAY | .933E+02 | .436E+02 | .467E+00 | .812E+02 | .272E+03 | 19 |
| TYPE PROJECT | .235E+01 | .823E+00 | .350E+00 | .100E+01 | .400E+01 | 77 |
| CONSTR. CHANGES | .135E+01 | .132E+01 | .974E+00 | .000E+00 | .300E+01 | 77 |
| TIME COMPLETE | .158E+04 | .114E+03 | .723E-01 | .136E+04 | .177E+04 | 17 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 17 |
| PRIORITY | .201E+01 | .124E+01 | .615E+00 | .167E+00 | .360E+01 | 17 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.34 | 1.668 | 5 | 5 |
| 2 | LEECC | 6 | 2.97 | 2.380 | 6 | 6 |
| 3 | REQ | 6 | 3.16 | 2.504 | 6 | 0 |
| 4 | BDEE | 7 | 2.65 | 2.138 | 7 | 2 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 5 | 2.54 | 2.085 | 5 | 2 |
| 7 | MPROG | 6 | 1.66 | 1.598 | 6 | 0 |
| 8 | AFRCE | 9 | 5.42 | 2.958 | 9 | 4 |
| 9 | COE | 18 | 8.90 | 4.024 | 18 | 6 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0203 |
| 8 | DI | CLOSED | .0959 |
| 9 | DISTR | CLOSED | .0548 |
| 10 | CORPS | CLOSED | .0795 |
| 11 | REV30 | CLOSED | .0384 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .3537 |
| 14 | HOLD | CLOSED | .9797 |
| 15 | HOLD1 | CLOSED | .9797 |

**HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 16  .208  .100E+01 +**********                                       +
 19  .247  .200E+01 +************          C                          +
 41  .532  .300E+01 +**************************                      C+
  1  .013  .400E+01 +*                                                C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 77                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .235E+01 | .823E+00 | .350E+00 | .100E+01 | .400E+01 | 77 |

**HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS   RELA    UPPER
FREQ  FREQ   CELL LIM 0         20        40        60        80        100
                      +    +    +    +    +    +    +    +    +    +    +
 32   .416   .000E+00 +*********************                          +
 11   .143   .100E+01 +*******                    C                   +
  9   .117   .200E+01 +******                           C             +
 25   .325   .300E+01 +****************                               C
  0   .000     INF    +                                               C
---                   +    +    +    +    +    +    +    +    +    +    +
 77                   0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

```
                       MEAN     STANDARD  COEFF. OF  MINIMUM    MAXIMUM   NO.OF
                       VALUE    DEVIATION VARIATION   VALUE      VALUE     OBS

CONSTR. CHANGES      .135E+01  .132E+01  .974E+00  .000E+00  .300E+01     77
```

**HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS   RELA    UPPER
FREQ  FREQ   CELL LIM 0         20        40        60        30        100
                      +    +    +    +    +    +    +    +    +    +    +
  0   .000   .000E+00 +                                               +
 17  1.000   .100E+01 +**************************************************
  0   .000   .200E+01 +                                               C
  0   .000   .300E+01 +                                               C
  0   .000     INF    +                                               C
---                   +    +    +    +    +    +    +    +    +    +    +
 17                   0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

```
                       MEAN     STANDARD  COEFF. OF  MINIMUM    MAXIMUM   NO.OF
                       VALUE    DEVIATION VARIATION   VALUE      VALUE     OBS

DELIVERY STATUS      .100E+01  .000E+00  .000E+00  .100E+01  .100E+01     17
```

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  5  .294  .100E+01 +***************                                  +
  3  .176  .200E+01 +*********               C                        +
  4  .235  .300EE+01 +************                       C            +
  5  .294  .400E+01 +***************                                  C
  0  .000    INF    +                                                 C
 ---                +    +    +    +    +    +    +    +    +    +    +
 17                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .201E+01 | .124E+01 | .615E+00 | .167E+00 | .360E+01 | 17 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/14/1985          RUN NUMBER 1 OF 1

CURRENT TIME .4015E+04
STATISTICAL ARRAYS CLEARED AT TIME .3650E+04

END OF YEAR 11

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .304E+03 | .683E+02 | .224E+00 | .218E+03 | .503E+03 | 25 |
| START DESIGN | .134E+03 | .362E+02 | .269E+00 | .826E+02 | .203E+03 | 20 |
| PROJ. PROGRAMMED | .269E+03 | .101E+03 | .376E+00 | .144E+03 | .666E+03 | 27 |
| HOST BASE ASSIGN | .880E+02 | .596E+00 | .122E+00 | .880E+02 | .880E+02 | 1 |
| CONG. DELAY | .750E+02 | .433E+02 | .577E+00 | .632E+02 | .253E+03 | 19 |
| TYPE PROJECT | .212E+01 | .900E+00 | .425E+00 | .100E+01 | .400E+01 | 69 |
| CONSTR. CHANGES | .170E+01 | .117E+01 | .688E+00 | .000E+00 | .300E+01 | 69 |
| TIME COMPLETE | .158E+04 | .184E+03 | .116E+00 | .137E+04 | .213E+04 | 24 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 24 |
| PRIORITY | .217E+01 | .130E+01 | .599E+00 | .316E+00 | .392E+01 | 24 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.40 | 1.672 | 5 | 1 |
| 2 | LEECC | 6 | 3.40 | 1.790 | 6 | 2 |
| 3 | REQ | 6 | 3.01 | 2.587 | 6 | 0 |
| 4 | BDEE | 7 | 1.72 | 2.098 | 6 | 0 |
| 5 | BASE | 1 | .21 | .406 | 1 | 0 |
| 6 | MDEE | 5 | 1.61 | 2.118 | 5 | 0 |
| 7 | MPROG | 6 | 1.57 | 1.575 | 6 | 0 |
| 8 | AFRCE | 9 | 4.47 | 3.437 | 9 | 2 |
| 9 | COE | 18 | 7.93 | 2.78 | 18 | 1 |

## **GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0235 |
| 8 | DI | CLOSED | .0959 |
| 9 | DISTR | CLOSED | .0685 |
| 10 | CORPS | OPEN | .0685 |
| 11 | REV30 | CLOSED | .0274 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .3790 |
| 14 | HOLD | OPEN | .9765 |
| 15 | HOLD1 | OPEN | .9765 |

## **HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
   0  .000  .000E+00 +                                                 +
  23  .333  .100E+01 +*****************                                +
  16  .232  .200E+01 +************               C                     +
  29  .420  .300E+01 +*********************                           C+
   1  .014  .400E+01 +*                                                C
   0  .000    INF    +                                                 C
 ---                +    +    +    +    +    +    +    +    +    +    +
  69                0        20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .212E+01 | .900E+00 | .425E+00 | .100E+01 | .400E+01 | 69 |

**HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 14  .203  .000E+00 +**********                                       +
 18  .261  .100E+01 +*************         C                          +
 12  .174  .200E+01 +*********                      C                 +
 25  .362  .300E+01 +******************                               C
  0  .000     INF   +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 69                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .170E+01 | .117E+01 | .688E+00 | .000E+00 | .300E+01 | 69 |

**HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 24 1.000  .100E+01 +**************************************************
  0  .000  .200E+01 +                                                 C
  0  .000  .300E+01 +                                                 C
  0  .000     INF   +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 24                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 24 |

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS  RELA    UPPER
FREQ FREQ   CELL LIM 0        20        40        60        80       100
                     +    +    +    +    +    +    +    +    +    +    +
  0  .000   .000E+00 +                                                 +
  6  .250   .100E+01 +**************                                   +
  6  .250   .200E+01 +**************          C                        +
  1  .042   .300E+01 +**                        C                      +
 11  .458   .400E+01 +************************                         C
  0  .000     INF    +                                                 C
---                  +    +    +    +    +    +    +    +    +    +    +
 24                  0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .217E+01 | .130E+01 | .599E+00 | .316E+00 | .392E+01 | 24 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/14/1985          RUN NUMBER 1 OF 1

CURRENT TIME .4380E+04
STATISTICAL ARRAYS CLEARED AT TIME .4015E+04

END OF YEAR 12

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .293E+03 | .430E+02 | .146E+00 | .257E+03 | .402E+03 | 18 |
| START DESIGN | .149E+03 | .396E+02 | .265E+00 | .945E+02 | .221E+03 | 20 |
| PROJ. PROGRAMMED | .302E+03 | .521E+02 | .129E+00 | .251E+03 | .398E+03 | 19 |
| HOST BASE ASSIGN | .870E+02 | .596E+01 | .120E+00 | .870E+02 | .870E+02 | 1 |
| CCNG. DELAY | .776E+02 | .209E+00 | .269E-02 | .772E+02 | .777E+02 | 12 |
| TYPE PROJECT | .205E+01 | .860E+00 | .419E+00 | .100E+01 | .400E+01 | 59 |
| CONSTR. CHANGES | .125E+01 | .125E+01 | .100E+01 | .000E+00 | .300E+01 | 59 |
| TIME COMPLETE | .161E+04 | .208E+03 | .129E+00 | .136E+04 | .208E+04 | 20 |
| DELIVERY STATUS | .110E+01 | .447E+00 | .407E+00 | .100E+01 | .300E+01 | 20 |
| PRIORITY | .198E+01 | .143E+01 | .724E+00 | .599E-01 | .366E+01 | 20 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.40 | 1.714 | 5 | 3 |
| 2 | LEECC | 6 | 3.01 | 2.231 | 6 | 5 |
| 3 | REQ | 6 | 2.83 | 2.692 | 6 | 0 |
| 4 | BDEE | 7 | 1.66 | 2.069 | 6 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 5 | 1.56 | 2.079 | 5 | 0 |
| 7 | MPROG | 6 | 1.50 | 1.587 | 6 | 0 |
| 8 | AFRCE | 9 | 4.13 | 3.510 | 9 | 1 |
| 9 | COE | 18 | 7.41 | 5.403 | 18 | 3 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0223 |
| 8 | DI | CLOSED | .0822 |
| 9 | DISTR | CLOSED | .0411 |
| 10 | CORPS | CLOSED | .0740 |
| 11 | REV30 | CLOSED | .0274 |
| 12 | CALL2 | CLOSED | .2474 |
| 13 | DI100 | OPEN | .3548 |
| 14 | HOLD | CLOSED | .9777 |
| 15 | HOLD1 | CLOSED | .9777 |

**HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 18  .305  .100E+01 +***************                                  +
 22  .373  .200E+01 +*******************              C               +
 17  .288  .300E+01 +**************                                 C +
  2  .034  .400E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 59                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .205E+01 | .860E+00 | .419E+00 | .100E+01 | .400E+01 | 59 |

## **HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 24  .407  .000E+00 +********************                             +
 12  .203  .100E+01 +**********                    C                  +
  7  .119  .200E+01 +******                             C             +
 16  .271  .300E+01 +**************                                   C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 59                 0        20        40        60        80       100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .125E+01 | .125E+01 | .100E+01 | .000E+00 | .300E+01 | 59 |

## **HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 19  .950  .100E+01 +************************************************ +
  0  .000  .200E+01 +                                               C +
  1  .050  .300E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 20                 0        20        40        60        80       100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .110E+01 | .447E+00 | .407E+00 | .100E+01 | .300E+01 | 20 |

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  7  .350  .100E+01 +*******************                              +
  2  .100  .200E+01 +*****                 C                          +
  4  .200  .300E+01 +**********                      C                +
  7  .350  .400E+01 +*******************                              C
  0  .000    INF    +                                                 C
 ---                +    +    +    +    +    +    +    +    +    +    +
 20                 0         20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .198E+01 | .143E+01 | .724E+00 | .599E-01 | .366E+01 | 20 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/14/1985          RUN NUMBER 1 OF 1

CURRENT TIME .4745E+04
STATISTICAL ARRAYS CLEARED AT TIME .4380E+04

END OF YEAR 13

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .347E+03 | .961E+02 | .277E+00 | .233E+03 | .652E+03 | 21 |
| START DESIGN | .139E+03 | .337E+02 | .242E+00 | .881E+02 | .196E+03 | 20 |
| PROJ. PROGRAMMED | .317E+03 | .102E+03 | .323E+00 | .146E+03 | .686E+03 | 38 |
| HOST BASE ASSIGN | | | NO VALUES RECORDED | | | |
| CONG. DELAY | .848E+02 | .481E+02 | .568E+00 | .718E+02 | .259E+03 | 15 |
| TYPE PROJECT | .237E+01 | .800E+00 | .338E+00 | .100E+01 | .400E+01 | 95 |
| CONSTR. CHANGES | .126E+01 | .124E+01 | .981E+00 | .000E+00 | .300E+01 | 95 |
| TIME COMPLETE | .155E+04 | .144E+03 | .926E-01 | .123E+04 | .183E+04 | 19 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 19 |
| PRIORITY | .144E+01 | .121E+01 | .841E+00 | .887E-01 | .390E+01 | 19 |

## **RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.40 | 1.757 | 5 | 5 |
| 2 | LEECC | 6 | 3.44 | 1.846 | 6 | 4 |
| 3 | REQ | 6 | 3.25 | 2.584 | 6 | 6 |
| 4 | BDEE | 7 | 2.56 | 2.287 | 6 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 5 | 2.43 | 2.277 | 5 | 0 |
| 7 | MPROG | 6 | 1.69 | 1.527 | 6 | 3 |
| 8 | AFRCE | 9 | 5.03 | 3.302 | 9 | 4 |
| 9 | COE | 18 | 8.60 | 4.791 | 18 | 8 |

## **GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0192 |
| 8 | DI | CLOSED | .1096 |
| 9 | DISTR | OPEN | .0521 |
| 10 | CORPS | CLOSED | .0877 |
| 11 | REV30 | CLOSED | .0301 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .4216 |
| 14 | HOLD | CLOSED | .9808 |
| 15 | HOLD1 | CLOSED | .9808 |

## **HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS   RELA   UPPER
FREQ  FREQ   CELL LIM 0         20        40        60        80        100
                      +    +    +    +    +    +    +    +    +    +    +
  0   .000  .000E+00  +                                                 +
 18   .189  .100E+01  +*********                                        +
 25   .263  .200E+01  +*************         C                          +
 51   .537  .300E+01  +***************************                     C+
  1   .011  .400E+01  +*                                                C
  0   .000    INF     +                                                 C
---                   +    +    +    +    +    +    +    +    +    +    +
 95                   0         20        40        60        80        100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .237E+01 | .800E+00 | .338E+00 | .100E+01 | .400E+01 | 95 |

```
                              **HISTOGRAM NUMBER 7**

                               CONSTRUCTION CHANGES

OBS  RELA    UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 38  .400  .000E+00 +********************                             +
 19  .200  .100E+01 +**********                    C                  +
 13  .137  .200E+01 +*******                              C           +
 25  .263  .300E+01 +*************                                    C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 95                 0        20        40        60        80       100

             **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

                        MEAN     STANDARD  COEFF. OF  MINIMUM    MAXIMUM  NO.OF
                        VALUE    DEVIATION VARIATION   VALUE      VALUE    OBS

CONSTR. CHANGES       .126E+01  .124E+01  .981E+00  .000E+00  .300E+01    95



                              **HISTOGRAM NUMBER 9**

                                 DELIVERY STATUS

OBS  RELA    UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 19 1.000  .100E+01 +**************************************************
  0  .000  .200E+01 +                                                 C
  0  .000  .300E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 19                 0        20        40        60        80       100

             **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

                        MEAN     STANDARD  COEFF. OF  MINIMUM    MAXIMUM  NO.OF
                        VALUE    DEVIATION VARIATION   VALUE      VALUE    OBS

DELIVERY STATUS       .100E+01  .000E+00  .000E+00  .100E+01  .100E+01    19
```

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80      100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 10  .526  .100E+01 +**************************                       +
  3  .158  .200E+01 +********                         C               +
  3  .158  .300E+01 +********                                 C       +
  3  .158  .400E+01 +********                                         C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 19                 0         20        40        60        80      100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .144E+01 | .121E+01 | .841E+00 | .887E-01 | .390E+01 | 19 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL   BY BLAKE & MARCHBANKS

DATE 8/14/1985   RUN NUMBER 1 OF 1

CURRENT TIME .5110E+04
STATISTICAL ARRAYS CLEARED AT TIME .4745E+04

END OF YEAR 14

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .324E+03 | .888E+02 | .274E+00 | .232E+03 | .523E+03 | 22 |
| START DESIGN | .134E+03 | .330E+02 | .246E+00 | .963E+02 | .195E+03 | 20 |
| PROJ. PROGRAMMED | .316E+03 | .129E+03 | .409E+00 | .133E+03 | .652E+03 | 20 |
| HOST BASE ASSIGN | .830E+02 | .785E+00 | .231E+00 | .830E+02 | .830E+02 | 1 |
| CONG. DELAY | .699E+02 | .186E+02 | .267E+00 | .449E+02 | .104E+03 | 17 |
| TYPE PROJECT | .211E+01 | .907E+00 | .429E+00 | .100E+01 | .400E+01 | 62 |
| CONSTR. CHANGES | .127E+01 | .133E+01 | .105E+01 | .000E+00 | .300E+01 | 62 |
| TIME COMPLETE | .153E+04 | .215E+03 | .141E+00 | .126E+04 | .218E+04 | 22 |
| DELIVERY STATUS | .109E+01 | .426E+00 | .391E+00 | .100E+01 | .300E+01 | 22 |
| PRIORITY | .168E+01 | .124E+01 | .739E+00 | .114E-02 | .376E+01 | 22 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.44 | 1.769 | 5 | 1 |
| 2 | LEECC | 6 | 2.64 | 2.384 | 6 | 5 |
| 3 | REQ | 6 | 2.88 | 2.412 | 6 | 0 |
| 4 | BDEE | 7 | 1.65 | 1.815 | 6 | 0 |
| 5 | BASE | 1 | .16 | .195 | 1 | 0 |
| 6 | MDEE | 5 | 1.48 | 1.794 | 5 | 0 |
| 7 | MPROG | 6 | 1.68 | 1.719 | 6 | 3 |
| 8 | AFRCE | 9 | 4.13 | 3.513 | 9 | 5 |
| 9 | COE | 18 | 6.74 | 4.998 | 18 | 4 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | CLOSED | .0242 |
| 8 | DI | OPEN | .0876 |
| 9 | DISTR | CLOSED | .0575 |
| 10 | CORPS | CLOSED | .0658 |
| 11 | REV30 | CLOSED | .0301 |
| 12 | CALL2 | CLOSED | .2472 |
| 13 | DI100 | OPEN | .2852 |
| 14 | HOLD | OPEN | .9758 |
| 15 | HOLD1 | OPEN | .9758 |

**HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 19  .306  .100E+01 ****************                                  +
 20  .323  .200E+01 *****************                C                +
 20  .323  .300E+01 *****************                               C +
  3  .048  .400E+01 ***                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 62                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .211E+01 | .907E+00 | .429E+00 | .100E+01 | .400E+01 | 62 |

**HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
 29  .468  .000E+00 +***********************                          +
  6  .097  .100E+01 +*****                      C                     +
  8  .129  .200E+01 +******                            C              +
 19  .306  .300E+01 +***************                                  C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 62                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .127E+01 | .133E+01 | .105E+01 | .000E+00 | .300E+01 | 62 |

**HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 21  .955  .100E+01 +************************************************ +
  0  .000  .200E+01 +                                               C +
  1  .045  .300E+01 +**                                               C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 22                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .109E+01 | .426E+00 | .391E+00 | .100E+01 | .300E+01 | 22 |

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
  7  .318  .100E+01 +****************                                 +
  7  .318  .200E+01 +****************               C                 +
  4  .182  .300E+01 +*********                               C        +
  4  .182  .400E+01 +*********                                        C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 22                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .168E+01 | .124E+01 | .739E+00 | .114E-02 | .376E+01 | 22 |

# S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL — BY BLAKE & MARCHBANKS

DATE 8/14/1985 — RUN NUMBER 1 OF 1

CURRENT TIME .5475E+04
STATISTICAL ARRAYS CLEARED AT TIME .5110E+04

END OF YEAR 15

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .325E+03 | .620E+02 | .191E+00 | .228E+03 | .469E+03 | 23 |
| START DESIGN | .127E+03 | .313E+02 | .247E+00 | .827E+02 | .189E+03 | 20 |
| PROJ. PROGRAMMED | .299E+03 | .132E+03 | .442E+00 | .130E+03 | .677E+03 | 18 |
| HOST BASE ASSIGN | | | NO VALUES RECORDED | | | |
| CONG. DELAY | .784E+02 | .626E+01 | .799E-01 | .686E+02 | .866E+02 | 15 |
| TYPE PROJECT | .220E+01 | .796E+00 | .362E+00 | .100E+01 | .400E+01 | 90 |
| CONSTR. CHANGES | .900E+00 | .117E+01 | .130E+01 | .000E+00 | .300E+01 | 90 |
| TIME COMPLETE | .156E+04 | .177E+03 | .113E+00 | .137E+04 | .195E+04 | 21 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 21 |
| PRIORITY | .213E+01 | .889E+00 | .418E+00 | .388E+00 | .381E+01 | 21 |

## **RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.42 | 1.706 | 5 | 1 |
| 2 | LEECC | 6 | 3.25 | 1.708 | 6 | 6 |
| 3 | REQ | 6 | 2.82 | 2.479 | 6 | 6 |
| 4 | BDEE | 7 | 2.65 | 2.388 | 6 | 0 |
| 5 | BASE | 1 | .23 | .479 | 1 | 1 |
| 6 | MDEE | 5 | 2.52 | 2.413 | 5 | 0 |
| 7 | MPROG | 6 | 1.48 | 1.534 | 6 | 2 |
| 8 | AFRCE | 9 | 5.27 | 3.591 | 9 | 6 |
| 9 | COE | 18 | 8.79 | 6.059 | 18 | 8 |

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0190 |
| 8 | DI | CLOSED | .0631 |
| 9 | DISTR | CLOSED | .0411 |
| 10 | CORPS | OPEN | .0470 |
| 11 | REV30 | CLOSED | .0329 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | OPEN | .3883 |
| 14 | HOLD | CLOSED | .9810 |
| 15 | HOLD1 | CLOSED | .9810 |

**HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 20  .222  .100E+01 +***********                                      +
 33  .367  .200E+01 +******************          C                    +
 36  .400  .300E+01 +********************                            C+
  1  .011  .400E+01 +*                                                C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 90                 0         20        40        60        80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .220E+01 | .796E+00 | .362E+00 | .100E+01 | .400E+01 | 90 |

**HISTOGRAM NUMBER 7**

CONSTRUCTION CHANGES

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 50  .556  .000E+00 +****************************                     +
 15  .167  .100E+01 +********                           C             +
  9  .100  .200E+01 +*****                                   C        +
 16  .178  .300E+01 +*********                                        C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 90                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| CONSTR. CHANGES | .900E+00 | .117E+01 | .130E+01 | .000E+00 | .300E+01 | 90 |

**HISTOGRAM NUMBER 9**

DELIVERY STATUS

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 21 1.000  .100E+01 +**************************************************
  0  .000  .200E+01 +                                                 C
  0  .000  .300E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 21                 0        20        40        60        80       100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 21 |

**HISTOGRAM NUMBER 10**

PRIORITY

```
OBS  RELA    UPPER
FREQ FREQ  CELL LIM 0         20         40         60         80        100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                  +
  2  .095  .100E+01 +*****                                             +
  9  .429  .200E+01 +*********************      C                      +
  7  .333  .300E+01 +*****************                        C        +
  3  .143  .400E+01 +********                                          C
  0  .000    INF    +                                                  C
---                 +    +    +    +    +    +    +    +    +    +    +
 21                 0         20         40         60         80        100
```

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| PRIORITY | .213E+01 | .889E+00 | .418E+00 | .388E+00 | .381E+01 | 21 |

S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT FACILITY MODEL          BY BLAKE & MARCHBANKS

DATE 8/14/1985          RUN NUMBER 1 OF 1

CURRENT TIME .5840E+04
STATISTICAL ARRAYS CLEARED AT TIME .5475E+04

END OF YEAR 16

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TIME TO 30% | .342E+03 | .101E+03 | .295E+00 | .233E+03 | .530E+03 | 10 |
| START DESIGN | .141E+03 | .390E+02 | .276E+00 | .963E+02 | .213E+03 | 20 |
| PROJ. PROGRAMMED | .305E+03 | .988E+02 | .323E+00 | .134E+03 | .671E+03 | 23 |
| HOST BASE ASSIGN | | | NO VALUES | RECORDED | | |
| CONG. DELAY | .934E+02 | .586E+02 | .628E+00 | .718E+02 | .270E+03 | 11 |
| TYPE PROJECT | .217E+01 | .907E+00 | .419E+00 | .100E+01 | .400E+01 | 48 |
| CONSTR. CHANGES | .144E+01 | .129E+01 | .895E+00 | .000E+00 | .300E+01 | 48 |
| TIME COMPLETE | .155E+04 | .136E+03 | .877E-01 | .137E+04 | .184E+04 | 16 |
| DELIVERY STATUS | .100E+01 | .000E+00 | .000E+00 | .100E+01 | .100E+01 | 16 |
| PRIORITY | .252E+01 | .124E+01 | .495E+00 | .260E+00 | .397E+01 | 16 |

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| 1 | LEECD | 5 | 1.43 | 1.744 | 5 | 3 |
| 2 | LEECC | 6 | 2.34 | 2.004 | 6 | 3 |
| 3 | REQ | 6 | 3.19 | 2.647 | 6 | 0 |
| 4 | BDEE | 7 | 2.50 | 2.384 | 6 | 0 |
| 5 | BASE | 1 | .00 | .000 | 0 | 0 |
| 6 | MDEE | 5 | 2.37 | 2.431 | 5 | 0 |
| 7 | MPROG | 6 | 1.65 | 1.609 | 6 | 0 |
| 8 | AFRCE | 9 | 5.02 | 3.858 | 9 | 9 |
| 9 | COE | 18 | 8.71 | 6.707 | 18 | 18 |

## **GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| 1 | CALL | CLOSED | .0822 |
| 2 | CALLN | CLOSED | .1644 |
| 3 | NEWFY | CLOSED | .2466 |
| 4 | NEED | CLOSED | .0027 |
| 5 | OTHER | CLOSED | .0027 |
| 6 | CONG28 | CLOSED | .0110 |
| 7 | FRC | OPEN | .0218 |
| 8 | DI | CLOSED | .0822 |
| 9 | DISTR | CLOSED | .0685 |
| 10 | CORPS | CLOSED | .0746 |
| 11 | REV30 | CLOSED | .0247 |
| 12 | CALL2 | CLOSED | .2466 |
| 13 | DI100 | CLOSED | .2766 |
| 14 | HOLD | CLOSED | .9782 |
| 15 | HOLD1 | CLOSED | .9782 |

## **HISTOGRAM NUMBER 6**

TYPE PROJECT

```
OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0         20        40        60        80      100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 15  .313  .100E+01 +***************                                  +
 11  .229  .200E+01 +***********               C                      +
 21  .438  .300E+01 +*********************                           C+
  1  .021  .400E+01 +*                                                C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 48                 0         20        40        60        80      100
```

## **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| TYPE PROJECT | .217E+01 | .907E+00 | .419E+00 | .100E+01 | .400E+01 | 48 |

```
                          **HISTOGRAM NUMBER 7**

                           CONSTRUCTION CHANGES

OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
 18  .375  .000E+00 *******************                               +
  6  .125  .100E+01 *******                  C                        +
  9  .188  .200E+01 **********                        C               +
 15  .313  .300E+01 *****************                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 48                 0        20        40        60        80       100


             **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

                  MEAN     STANDARD  COEFF. OF  MINIMUM    MAXIMUM  NO.OF
                  VALUE    DEVIATION VARIATION   VALUE       VALUE    OBS

CONSTR. CHANGES  .144E+01  .129E+01  .895E+00  .000E+00  .300E+01     48


                          **HISTOGRAM NUMBER 9**

                             DELIVERY STATUS

OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        30       100
                    +    +    +    +    +    +    +    +    +    +    +
  0  .000  .000E+00 +                                                 +
 16 1.000  .100E+01 ***************************************************
  0  .000  .200E+01 +                                                 C
  0  .000  .300E+01 +                                                 C
  0  .000    INF    +                                                 C
---                 +    +    +    +    +    +    +    +    +    +    +
 16                 0        20        40        60        80       100


             **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

                  MEAN     STANDARD  COEFF. OF  MINIMUM    MAXIMUM  NO.OF
                  VALUE    DEVIATION VARIATION   VALUE       VALUE    OBS

DELIVERY STATUS  .100E+01  .000E+00  .000E+00  .100E+01  .100E+01     16
```

```
                         **HISTOGRAM NUMBER 10**

                                PRIORITY

OBS   RELA    UPPER
FREQ  FREQ   CELL LIM 0        20        40        60        80       100
                      +    +    +    +    +    +    +    +    +    +    +
  0   .000   .000E+00 +                                                 +
  2   .125   .100E+01 +******                                           +
  4   .250   .200E+01 +*************      C                             +
  4   .250   .300E+01 +*************                  C                 +
  6   .375   .400E+01 +******************                               C
  0   .000     INF    +                                                 C
---                   +    +    +    +    +    +    +    +    +    +    +
 16                   0        20        40        60        80       100


              **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

                   MEAN      STANDARD  COEFF. OF   MINIMUM    MAXIMUM   NO.OF
                   VALUE     DEVIATION VARIATION    VALUE      VALUE     OBS

PRIORITY          .252E+01  .124E+01  .495E+00   .260E+00   .397E+01    16



                    S L A M   S U M M A R Y   R E P O R T

      SIMULATION PROJECT FACILITY MODEL            BY BLAKE & MARCHBANKS

      DATE  8/14/1985                              RUN NUMBER   1 OF 1

      CURRENT TIME      .5840E+04
      STATISTICAL ARRAYS CLEARED AT TIME    .5840E+04

                    * * * * END OF SIMULATION RUN * * * *
```

## Appendix G: Definition and Explanation of the SLAM Summary Report Statistics

The SLAM Summary Report displays the statistical results for each simulation run. The results are presented for time periods specified in the model network. The collection period for the integrated systems and facilities models in Appendices C, D, and F is one year. Thus a summary report is generated at the end of each simulated year.

Each SLAM Summary Report is comprised of a general data section followed by the statistical data collected within the model network. Data are collected by the collect statements included in the computer code and on the assigned files and activities in the network. The report also includes gate and resource statistics. The file and activity statistics were included only in Appendix C since they were used primarily during model verification and validation (M:162-167).

The following information is intended to assist the reader in understanding the information provided in the Summary Report. Each of the headings included in the report is reproduced below. The data labels in the heading are referenced to a definition of the data item by the code in brackets ([ ]). The definitions of the data items immediately follow the heading in which they are included.

## S L A M   S U M M A R Y   R E P O R T

SIMULATION PROJECT [AA] BY [AB]

DATE [AC] RUN NUMBER [AD] OF [AE]

CURRENT TIME [AF]
STATISTICAL ARRAYS CLEARED AT TIME [AG]

END OF YEAR [AH]

AA - The simulation project title.

AB - The name of the model analyst.

AC - The month/day/year of the simulation run.

AD - The number of the simulation run.

AE - The number of runs to be accomplished.

AF - The current time in the simulation at which statistics are being collected.

AG - The time statistics were last collected and cleared.

AH - The value of the current simulation time in years.

**STATISTICS FOR VARIABLES BASED ON OBSERVATION**

| | MEAN VALUE | STANDARD DEVIATION | COEFF. OF VARIATION | MINIMUM VALUE | MAXIMUM VALUE | NO.OF OBS |
|---|---|---|---|---|---|---|
| [BA] | [BB] | [BC] | [BD] | [BE] | [BF] | [BG] |

BA - Title of the collected statistics.

BB - The arithmetic mean of the observed values.

BC - The standard deviation of the observed values.

BD - The coefficient of variation (standard deviation/mean) of the observed values.

BE - The minimum value recorded.

BF - The maximum value recorded.

BG - The number of observed values.

**FILE STATISTICS**

| FILE NUMBER | ASSOCIATED NODE TYPE | AVERAGE LENGTH | STANDARD DEVIATION | MAXIMUM LENGTH | CURRENT LENGTH | AVERAGE WAIT TIME |
|---|---|---|---|---|---|---|
| [CA] | [CB] | [CC] | [CD] | [CE] | [CF] | [CG] |

CA - The file number or model's event calendar.

CB - File type (await, calendar) assigned in the network.

CC - The average number of entities (projects or events)

CD - The standard deviation of the number of entities in the file over the collection period.

CE - The maximum number in the file at any one time.

CF - The current number in the file.

CG - The average waiting time of all entities that entered the file (includes those that did not wait).

**REGULAR ACTIVITY STATISTICS**

| ACTIVITY INDEX | AVERAGE UTILIZATION | STANDARD DEVIATION | MAXIMUM UTILIZATION | CURRENT UTILIZATION | ENTITY COUNT |
|---|---|---|---|---|---|
| [DA] | [DB] | [DC] | [DD] | [DE] | [DF] |

DA - The activity index number assigned within the model network.

DB - Average number of entities processing through the activity at one time.

DC - The standard deviation of the number of entities is an activity at over the collection period.

DD - The maximum number of entities in the activity at one time.

DE - The number of entities is an activity at the current time.

DF - The number of entities which completed the activity during the collection period.

**RESOURCE STATISTICS**

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT CAPACITY | AVERAGE UTIL | STANDARD DEVIATION | MAXIMUM UTIL | CURRENT UTIL |
|---|---|---|---|---|---|---|
| [EA] | [EB] | [EC] | [ED] | [EE] | [EF] | [EG] |

| RESOURCE NUMBER | RESOURCE LABEL | CURRENT AVAILABLE | AVERAGE AVAILABLE | MINIMUM AVAILABLE | MAXIMUM AVAILABLE |
|---|---|---|---|---|---|
| [EH] | [EI] | [EJ] | [EK] | [EL] | [EM] |

EA - The resource number assigned. Simply shows order of resource title input.

EB - The resource title assigned in the RESOURCE statement.

EC - The current capacity or quantity of the resource assigned.

ED - The average utilization of the resource over the collection period.

EE - The standard deviation of resource utilization over the collection period.

EF - The maximum number of the resource in use at one time.

EG - The quantity of the resource in use at the current time.
EH - The resource number assigned (same as EA).

EI - The resource title assigned by the RESOURCE statement.

EJ - The current quantity of the resource assigned.

EK - The average availability of the resource over the collection period.

EL - Minimum number of the resource available at any one time during the collection period.

EM - Maximum number available at any one time during the collection period.

**GATE STATISTICS**

| GATE NUMBER | GATE LABEL | CURRENT STATUS | PCT. OF TIME OPEN |
|---|---|---|---|
| [FA] | [FB] | [FC] | [FD] |

FA - The gate number assigned. The number corresponds to the order of input.

FB - The title of the gate as specified by the GATE statement.

FC - Current status of the gate (open or closed).

FD - The percentage of time the gate was open during the collection period divided by 100.

```
                    **HISTOGRAM NUMBER  [GA]**

                              [GB]

OBS  RELA   UPPER
FREQ FREQ  CELL LIM 0        20        40        60        80       100
                    +    +    +    +    +    +    +    +    +    +    +
[GC] [GD]   [GE]    +******[GF]                                       +
                    +                                  C [GG]         +
                    +                                                 +
                    +                                                 +
                    +                                                 +
             INF    +                                                 +
---                 +    +    +    +    +    +    +    +    +    +    +
[GH]                0        20        40        60        80       100


          **STATISTICS FOR VARIABLES BASED ON OBSERVATION**

                 MEAN    STANDARD  COEFF. OF  MINIMUM    MAXIMUM   NO.OF
                 VALUE   DEVIATION VARIATION   VALUE      VALUE     OBS.

                 [GI]      [GJ]       [GK]      [GL]       [GM]     [GN]
```

GA - The number of the histogram. This number corresponds to the order in which the Collect (COLCT) statement requesting the histogram appears in the model network. Since not all collect statements were coded for histogram generation these numbers will not appear in sequence.

GB - Title of the histogram. The title corresponds to the title of the collect statement.

GC - The number of values within the cell limits observed over the collection period.

GD - The relative frequency or percentage of total observations within the cell limits.

GE - The upper limit for each cell of the histogram. The final cell includes all values above the upper cell limit of the next to last cell.

GF - Graphic representation of the number in the cell.

GG - Plot points of the cummulative number observed. The value represents total number of observations in the plotted cell and all those below it.

GH - Total number of observations.

GI - The arithmetic mean of the values observed during the collection period.

GJ - The standard deviation of the values observed.

GK - The coefficient of variation of the observed values (standard deviation / mean).

GL - The minimum value observed during the collection period.

GM - The maximum value observed during the collection period.

GN - The total number of observations during the collection period.

For a more detailed explanation of individual statistics see Pritsker, Chapters 5 and 13 (35:150-168,488-522).

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## VITA

Captain Larry J. Blake was born on 7 March 1948 in Glendale, West Virginia and graduated from high school in Moundsville, West Virginia in 1966. He majored in mathematics and physics at West Liberty State College until entering the Air Force in 1969. After serving as an airborn radio and radar technician until 1974, he attended West Virginia University through the Airman Education and Commissioning Program. He graduated with a Bachelor of Science in Civil Engineering degree, cum laude, and received a commission in the Air Force following Officers' Training School in 1976. After commissioning, Captain Blake was assigned to the 96th Civil Engineering Squadron, Dyess AFB, Texas as the Chief of Construction Management. In 1980 he transferred to Cape Parry, Canada where he served as contract monitor for the Distant Early Warning System Office. In 1981 Captain Blake was reassigned to the Office of the Air Force Regional Civil Engineer for Ballistic Missile Support at Norton AFB, California. There he served as project manager for the Deep Underground Basing Egress Research and Development program and as a facilities project manager for the bed down of the Peacekeeper missile. In July of 1984, Captain Blake entered the School of Systems and Logistics, Air Force Institute of Technology, as a candidate for a masters degree in Engineering Management.

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## VITA

Captain Richard D. Marchbanks was born on 1 May 1947 in Atlanta, Georgia and graduated from high school in College Park, Georgia in 1965. After serving in the naval submarine service until 1972, he attended Georgia Institute of Technology and received a Bachelor of Science Degree in Electrical Engineering in 1976. Upon graduation, he received an Air Force commission through the ROTC program and was assigned as an electrical design engineer in the 3380th Civil Engineering Squadron at Keesler AFB in Mississippi. Captain Marchbanks transferred to Osan AB, Korea in 1980 and served as the Chief Electrical Engineer for the bed down of the 25th Tactical Fighter Squadron at Suwon AB, Korea. In 1981, he transferred to Suwon AB, Korea and established the Base Civil Engineering unit of the 6170th Combat Support Squadron. After serving as Base Civil Engineer at Suwon AB until 1983, he was transferred to the Aeronautical Systems Division as the systems facilities officer for the bed down of the Ground Launched Cruise Missile in Europe. In July 1984 he enrolled in the School of Systems and Logistics, Air Force Institute of Technology, as a candidate for a masters degree in Engineering Management. Captain Marchbanks is a registered professional engineer in the state of Mississippi.

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SECURITY CLASSIFICATION OF THIS PAGE

AD-A161116

## REPORT DOCUMENTATION PAGE

| | |
|---|---|
| 1a. REPORT SECURITY CLASSIFICATION: UNCLASSIFIED | 1b. RESTRICTIVE MARKINGS |
| 2a. SECURITY CLASSIFICATION AUTHORITY | 3. DISTRIBUTION/AVAILABILITY OF REPORT: Approved for public release; distribution unlimited |
| 2b. DECLASSIFICATION/DOWNGRADING SCHEDULE | |
| 4. PERFORMING ORGANIZATION REPORT NUMBER(S): AFIT/GEM/LSY/85S-9 | 5. MONITORING ORGANIZATION REPORT NUMBER(S) |
| 6a. NAME OF PERFORMING ORGANIZATION: School of Systems and Logistics; 6b. OFFICE SYMBOL (If applicable): AFIT/LS | 7a. NAME OF MONITORING ORGANIZATION |
| 6c. ADDRESS (City, State and ZIP Code): Air Force Institute of Technology, Wright-Patterson AFB, OH 45433 | 7b. ADDRESS (City, State and ZIP Code) |
| 8a. NAME OF FUNDING/SPONSORING ORGANIZATION; 8b. OFFICE SYMBOL (If applicable) | 9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER |
| 8c. ADDRESS (City, State and ZIP Code) | 10. SOURCE OF FUNDING NOS.: PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT NO. |
| 11. TITLE (Include Security Classification): See Block 19 | |

12. PERSONAL AUTHOR(S): Larry J. Blake, B.S., Capt, USAF and Richard D. Marchbanks, B.S., Capt, USAF

| 13a. TYPE OF REPORT | 13b. TIME COVERED | 14. DATE OF REPORT (Yr., Mo., Day) | 15. PAGE COUNT |
|---|---|---|---|
| MS Thesis | FROM ____ TO ____ | 1985 September | 343 |

16. SUPPLEMENTARY NOTATION

| 17. COSATI CODES FIELD | GROUP | SUB. GR. |
|---|---|---|
| 13 | 13 | |
| 13 | 02 | |

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number): Military Construction Program, MCP, Facility Acquisition, Military Construction Program Model, Weapon System Facilities Model.

19. ABSTRACT (Continue on reverse if necessary and identify by block number)


Title: ANALYSIS AND MODELING OF THE FACILITY ACQUISITION PROCESS AS IT RELATES TO THE DEVELOPMENT AND DEPLOYMENT OF NEW WEAPON SYSTEMS

Thesis Chairman: William F. Shaw, Lt Col, USAF
Assistant Professor of Systems Management


Approved for public release: IAW AFR 190-1.
Lynn E. Wolaver 2 Oct 85
LYNN E. WOLAVER
Dean for Research and Professional Development
Air Force Institute of Technology (ATC)
Wright-Patterson AFB OH 45433

| 20. DISTRIBUTION/AVAILABILITY OF ABSTRACT | 21. ABSTRACT SECURITY CLASSIFICATION |
|---|---|
| UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS ☐ | UNCLASSIFIED |

| 22a. NAME OF RESPONSIBLE INDIVIDUAL | 22b. TELEPHONE NUMBER (Include Area Code) | 22c. OFFICE SYMBOL |
|---|---|---|
| Alan E. M. Tucker, Major, USAF | 513-255-4437 | AFIT/LS |

DD FORM 1473, 83 APR EDITION OF 1 JAN 73 IS OBSOLETE.

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The purpose of this investigation was to identify potential modifications in the facilities acquisition process to better integrate it into a weapons system acquisition. In order to accomplish this objective, a computer model was developed to simulate the integrated systems and facilities acquisition process and determine what changes would most favorably impact facility acquisition schedules.

Development and analysis of the model concluded that conflicts in timing came from four sources: development of the listing of facilities required to support system bed down, development of the basing and development concepts, system and equipment changes during the facility acquisition period, and the date and definition of initial operational capability (IOC).

The following additional conclusions were reached regarding the integrated systems and facilities acquisition process. First, only sixty percent of the bed down facilities would be ready by IOC unless special management attention and handling are provided during processing. Further, an increase of personnel in the various elements of facilities acquisition may have little impact upon project processing time. Finally, the traditional civil engineering management philosophy of waiting for user submittal of requirements before responding may further aggravate an already difficult scheduling problem.

The following recommendations were developed as a result of the research. First, development of facility requirements should begin earlier in the systems acquisition cycle through increased civil engineering participation in research and development efforts. Second, design of a weapon system's technical facilities should be performed by the system's contractor with contract management and technical support provided by the product division and the Army Corps of Engineers. Finally, data item descriptions for system contractor facilities related support should be reviewed and implemented creatively to more effectively use the time from identification of the facility requirements to the weapons system initial operational capability date.

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